

PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS

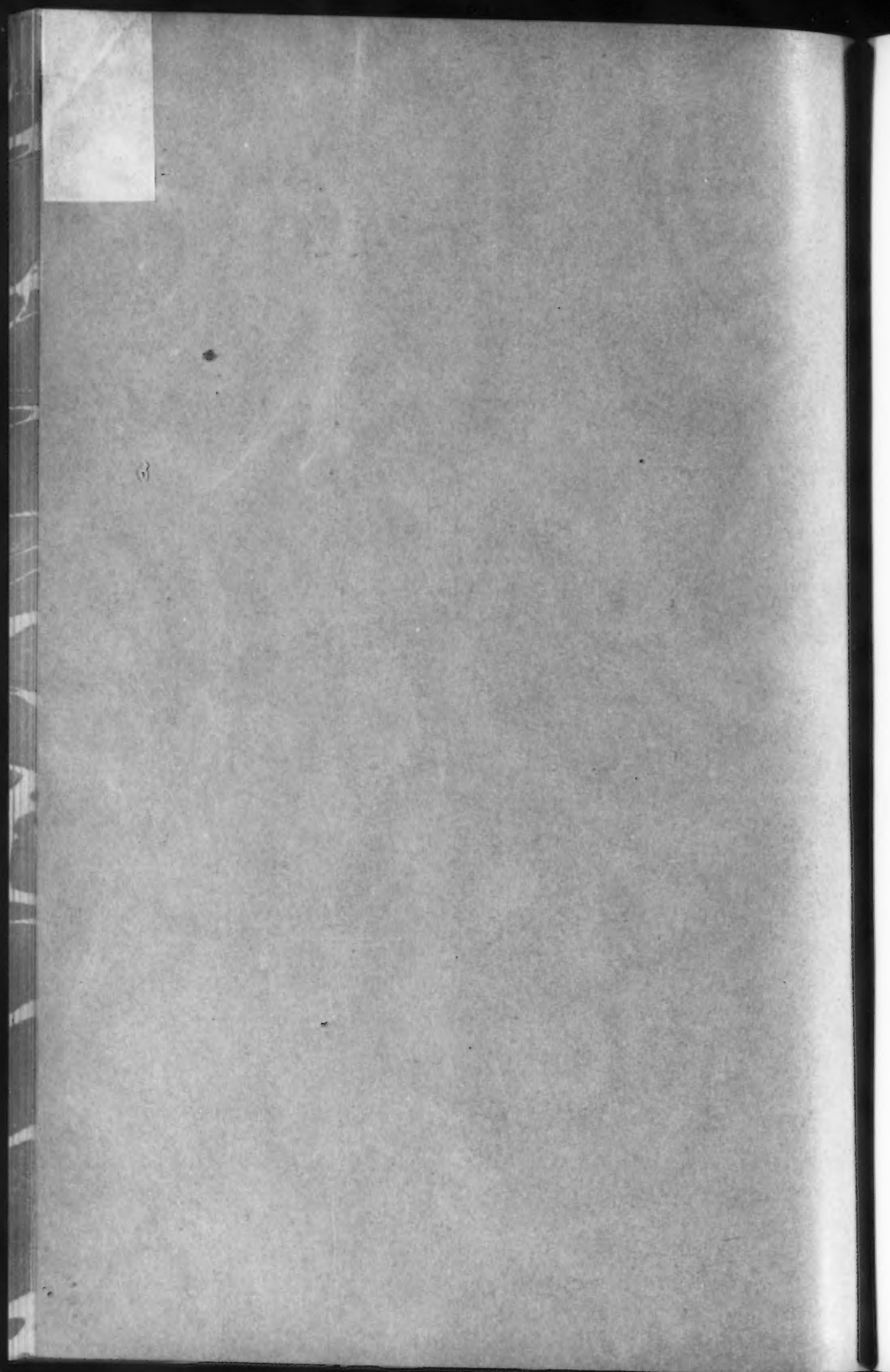
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PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS
(INSTITUTED 1852)

VOL. XXXVIII—No. 8
OCTOBER, 1912

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CONTENTS

Society Affairs.....	Pages 549 to 610.
Papers and Discussions.....	Pages 1189 to 1346.

NEW YORK 1912

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The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.

CABLE ADDRESS....."Ceas, New York."

AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed
in its publications.

SOCIETY AFFAIRS

CONTENTS

	PAGE
Minutes of Meetings:	
Of the Society, September 18th and October 2d, 1912.....	549
Of the Board of Direction, October 1st, 1912.....	555
Announcements:	
Hours during which the Society House is open.....	556
Future Meetings.....	556
List of Nominees for Offices to be filled January 15th, 1913.....	556
Searches in the Library.....	557
Papers and Discussions.....	557
Local Associations of Members of the American Society of Civil Engineers.....	558
Privileges of Engineering Societies Extended to Members.....	559
Accessions to the Library:	
Donations.....	561
By purchase.....	562
Membership (Additions, Changes of Address, Reinstatements, Resignations, Deaths).....	564
Recent Engineering Articles of Interest.....	576

MINUTES OF MEETINGS

OF THE SOCIETY

September 18th, 1912.—The meeting was called to order at 8.30 P. M.; Director T. Kennard Thomson in the chair; Chas. Warren Hunt, Secretary; and present, also, 77 members and 6 guests.

A paper by C. L. Annan, M. Am. Soc. C. E., entitled "Street Sprinkling in St. Paul, Minn.," was presented by the Secretary, who also read a communication on the subject from S. Whinery, M. Am. Soc. C. E. The paper was discussed orally by Arthur H. Blanchard, M. Am. Soc. C. E.

The Secretary also presented a paper by W. C. Hammatt, M. Am. Soc. C. E., entitled "A Western Type of Movable Weir Dam," and the subject was discussed orally by T. C. Atwood, M. Am. Soc. C. E.

The Secretary announced the following deaths:

BENJAMIN MORGAN HARROD (*Past-President*), elected Member, April 4th, 1877; died September 7th, 1912.

CHARLES LEWIS HARRISON, elected Member, March 2d, 1898; died September 14th, 1912.

JOSEPH ALLEN POWERS, elected Junior, April 2d, 1884; Member, September 3d, 1890; died September 1st, 1912.

Adjourned.

October 2d, 1912.—The meeting was called to order at 8.30 p. m.; Nelson P. Lewis, M. Am. Soc. C. E., in the chair; Chas. Warren Hunt, Secretary; and present, also, 175 members and 30 guests.

The minutes of the meeting of September 4th, 1912, were approved as printed in *Proceedings* for September, 1912.

Messrs. Kenneth Allen, Albert H. Dakin, Jr., and Albin G. Nicolaysen were appointed Tellers to canvass the ballot on the following proposed amendment to the Constitution:

“Strike out Article VII and substitute the following:

“ARTICLE VII.—NOMINATION AND ELECTION OF OFFICERS.

“1.—The Board of Direction shall, from time to time, divide the territory occupied by the membership into seven geographical districts, to be designated by numbers. District No. 1 shall be the territory within fifty miles of the Post Office in the City of New York. Each of the other districts shall be, as nearly as practicable, contiguous territory on State or Territorial lines; each shall contain, as nearly as practicable, an equal number of members, and they shall be designated as Districts Nos. 2, 3, 4, 5, 6, and 7. The Board shall announce such division to the Society on or before the first day of March in each year.

“2.—At the Annual Meeting of each year, seven Corporate Members, not officers of the Society, one from each of the geographical districts, shall be appointed by the meeting to serve for two years; who, with the seven members holding over and the five living last Past-Presidents of the Society, shall be a committee to nominate officers for the Society.

“The Board of Direction may prescribe the mode of procedure for appointing this committee, and fill any vacancies occurring.

“This committee shall meet at the Annual Convention of the Society, or at a time and place to be agreed upon by a majority of its members, but said meeting shall not be later than the fifteenth day of July. At this meeting this committee shall elect from among its members a Chairman and a Secretary to serve for one year beginning on the first day of the following September. At all meetings of the committee eight members shall constitute a quorum. If at any stated or called meeting of the committee there shall not be a quorum present, then such members as are present shall call an adjourned meeting for the transaction of the committee's business. This committee shall select nominees to fill the offices named in Article V, with the exception of the office of Secretary, so as to provide, with the officers holding over, a Vice-President and six Directors, residing in District No. 1, and twelve Directors divided equally, with regard to number and residence, among the remaining districts, Nos. 2, 3, 4, 5, 6, and 7.

In case any nominee or officer shall change his residence from one district to another, he shall continue to represent the district in which he resided when nominated. Nominations under this section shall be designated as 'Official Nominations.'

"A list of the nominees selected for the offices to be filled at the next Annual Election shall be presented by this committee to the Board of Direction not later than the first day of August, and the Secretary shall thereupon immediately notify each nominee of his nomination and ascertain his acceptance or declination.

"3.—Directly after the first day of October the aforesaid list of nominees shall be mailed to every Corporate Member whose address is known, provided that if any person shall be found by the Board of Direction to be ineligible for the office for which he is nominated, or should a nominee decline such nomination, his name shall not be sent out, but the Board shall substitute another name therefor, and further provided that in the event that the Nominating Committee fails to select a nominee for any office as above stipulated, the Board shall select a nominee therefor. The Board shall also fill any vacancies that may occur in this list of nominees up to the time the ballots are sent out. Vacancies shall be so filled as to preserve the geographical distribution of officers prescribed in Section 2 of this Article.

"4.—Additional nominations complying with Section 2 of this Article regarding the distribution of nominees among the several districts may be made by declaration, provided such declaration is accompanied by an acceptance of the nomination signed by the nominee, and is filed with the Secretary before the first day of December, and further provided that each declaration shall be signed by at least twenty-five Corporate Members. Nominations made in accordance with this Section shall be known as 'Nominations by Declaration.'

"5.—At least thirty days before the Annual Meeting there shall be mailed to every Corporate Member whose address is known a letter-ballot with envelopes for voting. This ballot shall include the names and residences of all persons nominated in accordance with this Article, the grades of membership, and, in the case of nominees for Directors, the number of the district in which they reside. Under the names of the nominees for each office so printed there shall be provided a space for the use of the voter if he desires to substitute another name. Nominations by Declaration shall be distinguished from Official Nominations by some convenient mark or words. There shall also be printed on the ballot the names of the Nominating Committee as created by Section 2 of this Article, with the numbers of the districts which the appointed members represent, and also in a separate list thereon the names and residences of the signers of each Nomination by Declaration.

"Voters may strike out the name of any nominee printed on the ballot for whom they do not wish to vote, and may substitute therefor, in writing or by paster, the name of any person eligible for the office; but the number of names voted for for any office shall not exceed the number of persons to be elected to such office. Ballots not complying with these provisions shall be rejected.

"Directions in accordance with these provisions shall be issued with the ballots.

"6.—Ballots may be sent by mail to the Secretary, or may be presented to him at the Society House. They should be enclosed in two sealed envelopes, and the outer envelope shall be endorsed by the voter's signature.

"The Secretary shall make a list of the voters from whom ballots are received, which list shall be open to inspection by all Corporate Members. A voter may withdraw his ballot, and may substitute another, at any time before the polls close.

"7.—The polls shall be closed at 9 A. M. on the first day of the Annual Meeting, and the ballots shall be canvassed publicly by tellers, who shall be appointed by the presiding officer.

"The persons who receive the largest number of votes for each office to be filled shall be declared elected.

"In case of a tie between two or more persons for the same office, the Annual Meeting shall elect the officer from among the persons so tied.

"The presiding officer shall announce to the meeting the names of the officers elected."

The Tellers reported as follows:

Total number of ballots received.....	734
Number of ballots received from Corporate Members not entitled to vote.....	19
Total number of ballots to be counted.....	715
Number of ballots in favor.....	680
Number of ballots against.....	31
Number of ballots blank.....	4
Total	715

KENNETH ALLEN,
ALBERT H. DAKIN, JR.,
ALBIN G. NICOLAYSEN.

The Chair declared the amendment carried.

A paper entitled "The Sixth Avenue Subway of the Hudson and Manhattan Railroad," by H. G. Burrowes, M. Am. Soc. C. E., was presented by the author, and illustrated with lantern slides. The paper was discussed orally by Messrs. William J. Boucher, Lazarus White, H. L. Oestreich, and the author. A written discussion by T. B. Whitney, Jr., M. Am. Soc. C. E., was presented by the Secretary.

The Secretary announced the election of the following candidates on October 1st, 1912:

AS MEMBERS

GEORGE LEWIS BEAN, Philadelphia, Pa.
THOMAS RUPE BEEMAN, Beverly, Wash.
DAVENPORT BROMFIELD, San Mateo, Cal.
EDWARD EMERY CARPENTER, Victoria, B. C., Canada
GEORGE THOMAS FORSYTH, Kansas City, Mo.

JAMES JOSIAS GAILLARD, Macon, Ga.
SAMUEL GOURDIN GAILLARD, Philadelphia, Pa.
WILLIAM HERBERT GIBSON, Philadelphia, Pa.
SIMON HENRY HARRISON, Ragland, Ala.
JOSEPH JOHN JESSUP, Berkeley, Cal.
RAY MESSINGER MURRAY, Spokane, Wash.
WILLIAM FULLERTON REEVES, New York City
WILLIAM JAMES SHACKELFORD, Greenville, Miss.
ROLAND ALDRICH THAYER, Greenville, S. C.
DEBERNIERE WHITAKER, Santiago de Cuba, Cuba
FREDERICK CHARLES WILSON, Felton, Cuba
HERBERT ALVA WILSON, Boston, Mass.
JAMES ALBERT WOODRUFF, Vicksburg, Miss.
CHARLES COLT YATES, Washington, D. C.

AS ASSOCIATE MEMBERS

WILLIAM FREDERICK ALFRED ANSON, Rural Retreat, Va.
ERNEST DANIEL BEAN, Medina, N. Y.
ROBERT ERNEST BEATY, New York City
HENRY CRIST BENSON, Tallulah Falls, Ga.
GORDON BYRON CANAGA, Manila, Philippine Islands
ELBERT MILAM CHANDLER, Burbank, Wash.
JESSE JOHN DAVY, Shakopee, Minn.
NEWBOLD DRAYTON, Sand Patch, Pa.
SAMUEL ALEXANDER FORTER, Pratt, Kans.
WILLIAM STROBRIDGE GELETTE, San Francisco, Cal.
HARRY J HANMER, Gloversville, N. Y.
GEORGE STEVENS HINCKLEY, Redlands, Cal.
ALBERT HARRISON HINKLE, Columbus, Ohio
LEWIS ALLEN JONES, Washington, D. C.
STANLEY ALBERT KERR, Helena, Mont.
JASON CASIMIR LeDUKE, Toledo, Ohio
ANDREW LENDERINK, Kalamazoo, Mich.
WALTER LAWRENCE LORAH, Bourne, Mass.
KERN WILSON McHOSE, Wilkinsburg, Pa.
CHARLES WILLIAM MARTIN, St. Louis, Mo.
ERNEST EDWARD MEIER, St. Louis, Mo.
EGMONT FELIX MITTMANN, Wichita Falls, Tex.
CHARLES MOSER, Palo Alto, Cal.
EDWIN RANDOLPH PAGE, Ansted, W. Va.
GEORGE AUSTIN QUINLAN, Chicago, Ill.
JOSEPH WARREN ROGERS, Shokan, N. Y.
JAMES SELDEN SHUTE, Brooklyn, N. Y.
WALTER PEARCE STINE, Aguadulce, Panama
ROBERT AUGUST STRECKER, Louisville, Ky.

ROBERT SUMMERS STRONACH, Westminster Junction,
B. C., Canada

JAMES HIRAM STURDEVANT, Watertown, N. Y.

HENRY TAYLOR, Kenova, W. Va.

JOHN EDWARD THORNTON, Waco, Tex.

ARTHUR CARLING TONER, Baltimore, Md.

PAUL PAGE WHITHAM, Seattle, Wash.

LESLIE BATEMAN WOODRUFF, Camden, N. J.

AS JUNIORS

HAROLD EDWARD AKERLY, Rochester, N. Y.

EARL DANIEL BROWN, Oakland, Cal.

CLEMENT EDWARDS CHASE, Toledo, Ohio

CLARENCE WESTGATE COOK, Los Angeles, Cal.

CARL CRANDALL, Ithaca, N. Y.

JOHN DUBUIS, Portland, Ore.

CHARLES FISCHER, JR., New Paltz, N. Y.

RALPH EDWARD GOODWIN, New York City

RUSSELL PLATT HASTINGS, Palo Alto, Cal.

GEORGE CLEVELAND HAUN, San Francisco, Cal.

RAYMOND CLARK HILL, Pittsburgh, Pa.

MILES CARY MACON JOHNSTON, Ithaca, N. Y.

WALTER HARLAN LECKLITER, Manila, Philippine Islands

GORDON GRANT MACLEISH, Ithaca, N. Y.

SEARLE BROWN NEVIUS, Oakland, Cal.

ELMER ALFRED PORTER, Salt Lake City, Utah

AUGUSTIN MITCHELL PRENTISS, Manila, Philippine Islands

RALPH REGINALD RANDELL, Seattle, Wash.

EARNEST CONRAD ROHDE, JR., Boulder, Colo.

WILLIAM EDWARD RUDOLPH, Brooklyn, N. Y.

JAMES RALPH SHIELDS, Berkeley, Cal.

NEIL THOM, JR., San Francisco, Cal.

LEM SEC TSANG, Troy, N. Y.

DAVID ROSWELL WYLIE, New York City

The Secretary announced the transfer of the following candidates
on October 1st, 1912:

FROM ASSOCIATE MEMBER TO MEMBER

WILLIAM JAMES BACKES, Hartford, Conn.

HOWARD EDWARD BOARDMAN, Buenos Aires, Argentine Republic

HENRY LILBURN GRAY, Olympia, Wash.

PAUL EVANS GREEN, Chicago, Ill.

ALFRED HANSON HARTMAN, Baltimore, Md.

GEORGE EBER STRATTON, Helena, Mont.

WALDO GILMAN WILDES, Rochester, N. Y.

ANDREW ALFRED WOODS, Vicksburg, Miss.

FROM JUNIOR TO ASSOCIATE MEMBER

NATHANIEL TOWNSEND BLACKBURN, Galveston, Tex.
KENNETH MACKENZIE CAMERON, Ottawa, Ont., Canada
LESTER LEVI CARTER, Los Angeles, Cal.
FRANCIS STIRLING CROWELL, Albany, N. Y.
WILLIAM HENRY DITTOE, Columbus, Ohio
JAMES CALVIN FOSS, JR., Kahului, Hawaii
ROBERT WALTER GAY, Agricultural College, Miss.
WILDER MELOY RICH, Grand Rapids, Mich.
FRANCIS RAUCH SCHMID, New York City
ALFRED LOCKWOOD TROWBRIDGE, San Francisco, Cal.
EARLL CHASE WEAVER, Ashland, Ore.
CLEMENT CLARENCE WILLIAMS, Chicago, Ill.
DAVID LEROY YARNELL, Washington, D. C.

The Secretary announced the following deaths:

JAMES DIX SCHUYLER, elected Member, December 6th, 1882; died September 13th, 1912.

ROWAN AYRES, elected Associate Member, July 9th, 1912; died August 13th, 1912.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

October 1st, 1912.—Director Loomis in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bush, Clarke, Endicott, Gerber, Kimball, Knap, Ridgway, and Snow.

Ballots for membership were canvassed, resulting in the election of 19 Members, 36 Associate Members, and 24 Juniors, and the transfer of 13 Juniors to the grade of Associate Member.

Eight Associate Members were transferred to the grade of Member. Applications were considered and other routine business transacted.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

November 6th, 1912.—8.30 P. M.—A regular business meeting will be held, and two papers will be presented for discussion, as follows: "The Flood of March 22d, 1912, at Pittsburgh, Pa.," by Kenneth C. Grant, Assoc. M. Am. Soc. C. E.; and "State and National Water Laws, with Detailed Statement of the Oregon System of Water Titles," by John H. Lewis, Assoc. M. Am. Soc. C. E.

Mr. Grant's paper was printed in *Proceedings* for August, 1912, and Mr. Lewis' paper appeared in the September, 1912, *Proceedings*.

November 20th, 1912.—8.30 P. M.—At this meeting two papers will be presented for discussion, as follows: "The Sewickley Cantilever Bridge Over the Ohio River," by A. W. Buel, M. Am. Soc. C. E.; and "Ports of the Pacific," by H. M. Chittenden, M. Am. Soc. C. E., assisted by A. O. Powell, M. Am. Soc. C. E.

These papers were printed in *Proceedings* for September, 1912.

December 4th, 1912.—8.30 P. M.—This will be a regular business meeting. Two papers will be presented for discussion, as follows: "Tufa Cement, as Manufactured and Used on the Los Angeles Aqueduct," by J. B. Lippincott, M. Am. Soc. C. E.; and "The Economic Aspect of Seepage and Other Losses in Irrigation Systems," by E. G. Hopson, M. Am. Soc. C. E.

These papers are printed in this number of *Proceedings*.

LIST OF NOMINEES FOR THE OFFICES TO BE FILLED AT THE ANNUAL ELECTION, JANUARY 15th, 1913

The following list of nominees for the offices to be filled at the Annual Meeting, January 15th, 1913, received from the Nominating Committee, was presented to the Board of Direction at its meeting on September 3d, 1912. The list has already been mailed to all Corporate Members:

For President, to serve one year:

GEORGE F. SWAIN, Cambridge, Mass.

For Vice-Presidents, to serve two years:

J. WALDO SMITH, New York City.

CHARLES H. RUST, Victoria, B. C., Canada.

For Treasurer, to serve one year:

JOHN F. WALLACE, New York City.

For Directors, to serve three years:

HENRY W. HODGE, New York City.....	District No. 1
JAMES H. EDWARDS, Passaic, N. J.....	District No. 1
LEONARD METCALF, Boston, Mass.....	District No. 2
HENRY R. LEONARD, Philadelphia, Pa.....	District No. 4
EDWARD H. CONNOR, Leavenworth, Kans...	District No. 5
SAMUEL H. HEDGES, Seattle, Wash.....	District No. 7

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

Proceedings, and set down for presentation to a future meeting of the Society, and, on these oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 p. m., at the Palace Hotel on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Gavin N. Houston, M. Am. Soc. C. E., 409 Equitable Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and, until further notice, will take place at the Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

Atlanta Association

On March 14th, 1912, the Atlanta Association of Members of the American Society of Civil Engineers was organized, with the following officers: Arthur Pew, President; William A. Hansell, Jr., Secretary; and Messrs. James N. Hazlehurst and Alexander Bonnyman, Members of the Executive Committee. The Association will hold its meetings in the house of the University Club.

**PRIVILEGES OF ENGINEERING SOCIETIES
EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Cívís Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniørforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 302 Board of Trade Building, Scranton, Pa.

Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

- Institution of Engineers of the River Plate**, Buenos Aires, Argentine Republic.
- Institution of Naval Architects**, 5 Adelphi Terrace, London, W. C., England.
- Junior Institution of Engineers**, 39 Victoria Street, Westminster, S. W., London, England.
- Koninklijk Instituut van Ingenieurs**, The Hague, The Netherlands.
- Louisiana Engineering Society**, 321 Hibernia Bank Building, New Orleans, La.
- Memphis Engineering Society**, Memphis, Tenn.
- Midland Institute of Mining, Civil and Mechanical Engineers**, Sheffield, England.
- Montana Society of Engineers**, Butte, Mont.
- North of England Institute of Mining and Mechanical Engineers**, Newcastle-upon-Tyne, England.
- Oesterreichischer Ingenieur- und Architekten-Verein**, Eschenbachgasse 9, Vienna, Austria.
- Pacific Northwest Society of Engineers**, 803 Central Building, Seattle, Wash.
- Rochester Engineering Society**, Rochester, N. Y.
- Sachsischer Ingenieur- und Architekten-Verein**, Dresden, Germany.
- Sociedad Colombiana de Ingenieros**, Bogota, Colombia.
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ELEVATOR SHAFT CONSTRUCTION.

Or, Practical Suggestions for the Installation of Electric Elevators in Buildings. By H. Robert Cullmer, Assisted by Albert Bauer. Cloth, 9 $\frac{3}{4}$ x 6 $\frac{3}{4}$ in., illus., 174 pp. New York, The William T. Comstock Company, 1912. \$3.00.

The principal purpose of this book, it is stated, is to emphasize the necessity of the co-operation of all parties connected with the work of elevator shaft construction and elevator installation, in order to produce the best results and the necessary economy. The subject-matter is said to cover every detail of elevator shaft construction, from the preparation of the drawings to the installation of the machinery, for elevators of various kinds. The articles on elevator shaft doors and machine rooms are said to contain information which will be especially useful to the architect in the preparation of plans, and, because of the difficulty of the problem involved, the article on the height of the elevator shaft bulkhead is detailed, the plates used for illustration conforming to the requirements of existing municipal regulations. Two forms of specifications for elevator equipment, one a simple one for a single door and the other for cars suitable for office buildings, have been included. A chapter has been devoted to the rules and regulations in regard to elevator installations, of New York City, and the author has also made a comparison with similar regulations in use in other cities. The Contents are: Elevator Shafts; Specifications for Elevator Work; Door Opening Devices and Elevator Car Gates; Elevator Signal Systems and Special Appliances; Rules and Regulations Governing Elevator Installation in New York City; Index.

ARTISTIC BRIDGE DESIGN.

A Systematic Treatise on the Design of Modern Bridges According to Aesthetic Principles. By Henry Grattan Tyrrell. With an Introduction by Thomas Hastings. Cloth, 9 $\frac{1}{4}$ x 6 $\frac{1}{4}$ in., illus., 16 + 294 pp. Chicago, The Myron C. Clark Publishing Co., 1912. \$3.00.

In his preface the author states that very little attention has been given by American engineers to the artistic character of bridges, their proper proportions, and the selection of economic types. As far as the purely constructive features are concerned, almost all the problems have been solved, and it is hoped that the engineer of the Twentieth Century will insist upon and establish a higher standard of artistic treatment. This book, the subject-matter of which is a development of a series of articles on the subject first published in *The American Architect*, in 1901, is said to be the first systematic attempt made in the United States to apply the economic to the artistic in bridge design. In it the author gives his reasons why bridges should be ornamental and why they are not, and shows by many illustrations and descriptions how to construct them artistically, stating that as the lack of art in bridge design is due partly to the dearth of literature on the subject and the difficulty of securing good illustrations, he hopes the book will be of some help in producing better results in the future. The Chapter headings are: Importance of Bridges; Reasons for Art in Bridges; Standards of Art in Bridges; Causes for Lack of Art; Special Features of Bridges; Principles of Design; Ordinary Steel Structures; Cantilever Bridges; Metal Arches; Suspension Bridges; Masonry Bridges; Illustrations and Descriptions; Index.

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Waterways versus Railways. By Harold G. Moulton. Houghton, Mifflin Company, Boston and New York, 1912.

Primer of Scientific Management. By Frank B. Gilbreth. With an Introduction by Louis D. Brandeis. D. Van Nostrand Company, New York, 1912.

Mills' Irrigation Manual for Lawyers, Irrigation Officers, Engineers and Water Users: Being a Treatise on the Law of Irrigation, Together with the Statutes and Forms of Seventeen States and Territories. By J. Warner Mills. The Mills Publishing Co., Denver, 1907.

Central Station Heating. By Byron T. Gifford. Heating and Ventilating Magazine Co., New York, 1912.

A Text-Book of Rand Metallurgical Practice, Designed as a Working Tool and Practical Guide for Metallurgists upon the Witwatersrand and Other Similar Fields. By Ralph Stokes and others. Vol. 1. J. B. Lippincott, Philadelphia; Charles Griffin & Co., Ltd., London, 1911.

Reports of Decisions of the Public Service Commission, First District of the State of New York. 2 Vol. v. 1. July 1st, 1907-Sept. 1st, 1909; v. 3. Feb. 1st, 1912 to Aug. 1st, 1912. Public Service Commission, First District, New York, 1912.

Proceedings of the Twenty-third Annual Convention of the National Association of Railway Commissioners: Digest of Decisions of the Federal and State Courts, Interstate Commerce Act, Safety Appliance Acts, Arbitration Act, etc.: Compilation of the Laws of the States Pertaining to Railways and Other Public Service Corporations. Comp. by Herman B. Meyers. Traffic Service Bureau, Chicago and Washington, 1912.

An Introduction to the Theory of Statistics. By G. Udny Yule. Second Edition, Revised. J. B. Lippincott Co., Philadelphia; Charles Griffin and Co., Ltd., London, 1912.

The Refrigerating Engineer's Pocket Manual. By Oswald Gueth. New York, 1908.

Proceedings of the International Association for Testing Materials: Vol. 2, Nos. 11-12. Vienna, July, 1912.

The Human Factor in Works Management. By James Hartness. McGraw-Hill Book Company, New York and London, 1912.

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Stillman Co., 26 Exchange Pl., Jersey City, N. J. } M. Sept. 3, 1912	
GODDARD, WILLIAM BUCK, JR. Structural Engr., M. C. R. R., Room 114, M. C. R. R. Station, Detroit, Mich.....	Sept. 3, 1912
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	M. Sept. 3, 1912
HONNESS, GEORGE GILL. Dept. Engr., Reservoir Dept., Board of Water Supply, City of New York, Brown Station, N. Y. } Jun. Feb. 2, 1897	
	Assoc. M. Sept. 4, 1901
	M. Sept. 3, 1912
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	M. Sept. 3, 1912
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	M. Sept. 3, 1912
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	M. Sept. 3, 1912
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	Assoc. M.	Sept. 3, 1912
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REINSTATEMENTS

JUNIORS

	Date of Reinstatement.
LAKE, ORLOFF.....	Sept. 3, 1912

RESIGNATIONS

MEMBERS

	Date of Resignation.
SOUTHER, HENRY.....	Sept. 3, 1912

ASSOCIATES

ANDERSON, ROBERT.....	Sept. 3, 1912
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JUNIORS

BORLAND, BRUCE.....	July 18, 1912
BROWN, ARTHUR ROBERT.....	Sept. 3, 1912

DEATHS

- AYRES, ROWAN. Elected Associate Member, July 9th, 1912; died August 13th, 1912.
- HARRISON, CHARLES LEWIS. Elected Member, March 2d, 1898; died September 14th, 1912.
- HARROD, BENJAMIN MORGAN. (*Past-President*). Elected Member, April 4th, 1877; died September 7th, 1912.
- POWERS, JOSEPH ALLEN. Elected Junior, April 2d, 1884; Member, September 3d, 1890; died September 1st, 1912.
- SCHUYLER, JAMES DIX. Elected Member, December 6th, 1882; died September 13th, 1912.

Total Membership of the Society, October 3d, 1912,

6 671

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(September 6th to October 2d, 1912)

NOTE.—This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- (1) *Journal*, Assoc. Eng. Soc., Boston, Mass., 30c.
- (2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
- (3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
- (4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
- (5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
- (6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
- (7) *Gesundheits Ingenieur*, München, Germany.
- (8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
- (9) *Engineering Magazine*, New York City, 25c.
- (10) *Cassier's Magazine*, New York City, 25c.
- (11) *Engineering* (London), W. H. Wiley, New York City, 25c.
- (12) *The Engineer* (London), International News Co., New York City, 35c.
- (13) *Engineering News*, New York City, 15c.
- (14) *The Engineering Record*, New York City, 10c.
- (15) *Railway Age Gazette*, New York City, 15c.
- (16) *Engineering and Mining Journal*, New York City, 15c.
- (17) *Electric Railway Journal*, New York City, 10c.
- (18) *Railway and Engineering Review*, Chicago, Ill., 15c.
- (19) *Scientific American Supplement*, New York City, 10c.
- (20) *Iron Age*, New York City, 20c.
- (21) *Railway Engineer*, London, England, 1s. 2d.
- (22) *Iron and Coal Trades Review*, London, England, 6d.
- (23) *Bulletin*, American Iron and Steel Assoc., Philadelphia, Pa.
- (24) *American Gas Light Journal*, New York City, 10c.
- (25) *American Engineer*, New York City, 20c.
- (26) *Electrical Review*, London, England, 4d.
- (27) *Electrical World*, New York City, 10c.
- (28) *Journal*, New England Water-Works Assoc., Boston, Mass., \$1.
- (29) *Journal*, Royal Society of Arts, London, England, 1d.
- (30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
- (31) *Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand*, Brussels, Belgium, 4 fr.
- (32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
- (33) *Le Génie Civil*, Paris, France, 1 fr.
- (34) *Portefeuille Economiques des Machines*, Paris, France.
- (35) *Nouvelles Annales de la Construction*, Paris, France.
- (36) *Cornell Civil Engineer*, Ithaca, N. Y.
- (37) *Revue de Mécanique*, Paris, France.
- (38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
- (39) *Technisches Gemeindeblatt*, Berlin, Germany, 0,70 m.
- (40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfg.
- (41) *Elektrotechnische Zeitschrift*, Berlin, Germany.
- (42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, \$1.
- (43) *Annales des Ponts et Chaussées*, Paris, France.
- (44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
- (45) *Mines and Minerals*, Scranton, Pa., 25c.
- (46) *Scientific American*, New York City, 15c.
- (47) *Mechanical Engineer*, Manchester, England, 3d.
- (48) *Zeitschrift, Verein Deutscher Ingenieure*, Berlin, Germany, 1.60 m.
- (49) *Zeitschrift für Bauwesen*, Berlin, Germany.
- (50) *Stahl und Eisen*, Düsseldorf, Germany.
- (51) *Deutsche Bauzeitung*, Berlin, Germany.
- (52) *Rigasche Industrie-Zeitung*, Riga, Russia, 25 kop.
- (53) *Zeitschrift, Oesterreichischer Ingenieur und Architekten Verein*, Vienna, Austria, 70h.

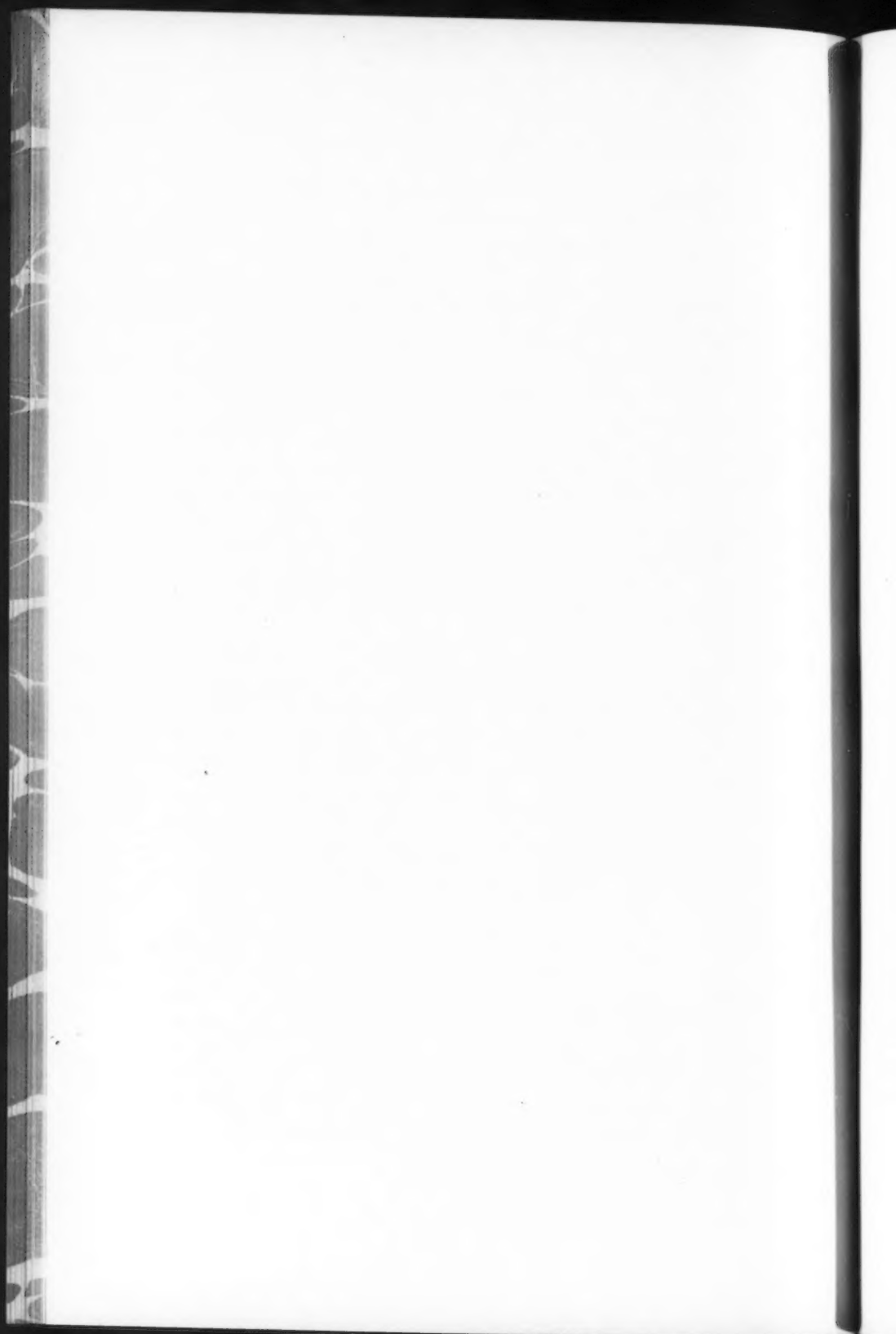
- (54) *Transactions*, Am. Soc. C. E., New York City, \$4.
 (55) *Transactions*, Am. Soc. M. E., New York City, \$10.
 (56) *Transactions*, Am. Inst. Min. Engrs., New York City, \$6.
 (57) *Colliery Guardian*, London, England, 5d.
 (58) *Proceedings*, Engrs.' Soc. W. Pa., 803 Fulton Bldg., Pittsburgh, Pa., 50c.
 (59) *Proceedings*, American Water Works Assoc., Troy, N. Y.
 (60) *Municipal Engineering*, Indianapolis, Ind., 25c.
 (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
 (62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
 (63) *Minutes of Proceedings*, Inst. C. E., London, England.
 (64) *Power*, New York City, 5c.
 (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
 (66) *Journal of Gas Lighting*, London, England, 6d.
 (67) *Cement and Engineering News*, Chicago, Ill., 25c.
 (68) *Mining Journal*, London, England, 6d.
 (69) *Der Eisenbau*, Leipzig, Germany.
 (70) *Engineering Review*, New York City, 10c.
 (71) *Journal*, Iron and Steel Inst., London, England.
 (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
 (73) *Electrician*, London, England, 18c.
 (74) *Transactions*, Inst. of Min. and Metal., London, England.
 (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
 (76) *Brick*, Chicago, Ill., 10c.
 (77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
 (78) *Beton und Eisen*, Vienna, Austria, 1.50m.
 (79) *Forschungsarbeiten*, Vienna, Austria.
 (80) *Tonindustrie Zeitung*, Berlin, Germany.
 (81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
 (83) *Progressive Age*, New York City, 15c.
 (84) *Le Ciment*, Paris, France.
 (85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
 (86) *Engineering-Contracting*, Chicago, Ill., 10c.
 (87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
 (88) *Bulletin of the International Ry. Congress Assoc.*, Brussels, Belgium.
 (89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., \$5.
 (90) *Transactions*, Inst. of Naval Archts., London, England.
 (91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
 (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
 (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
 (94) *The Boiler Maker*, New York City, 10c.
 (95) *International Marine Engineering*, New York City, 20c.
 (96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
 (98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
 (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$2.
 (100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
 (101) *Metal Worker*, New York City, 10c.
 (102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
 (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
 (104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
 (105) *Metallurgical and Chemical Engineering*, New York City, 25c.
 (106) *Transactions*, Inst. of Mining Engrs., London, England, 6s.
 (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
 (108) *Southern Machinery*, Atlanta, Ga., 10c.

LIST OF ARTICLES

Bridges.

- Report of Sub-Committee of the Am. Ry. Eng. Assoc. on Impact Tests.* (85) Vol. 12, Pt. 3.
 Report of Committee 7 of the Am. Ry. Eng. Assoc. on Wooden Bridges and Trestles.* (85) Vol. 12, Pt. 1; Vol. 13.
 The Design of Railway Bridge Abutments.* J. H. Prior. (Paper read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.
 Specifications for the Erection of Railroad Bridges. (Report of Committee, Am. Ry. Eng. Assoc.) (85) Vol. 12, Pt. 3; Vol. 13.
 On the Greatest Bending Moment Produced by Cooper's E-40 Loading.* W. H. Schuerman. (85) Vol. 12, Pt. 3.
 Arch Design; Specialization and Patents.* Daniel B. Luten. (4) Sept.

*Illustrated.



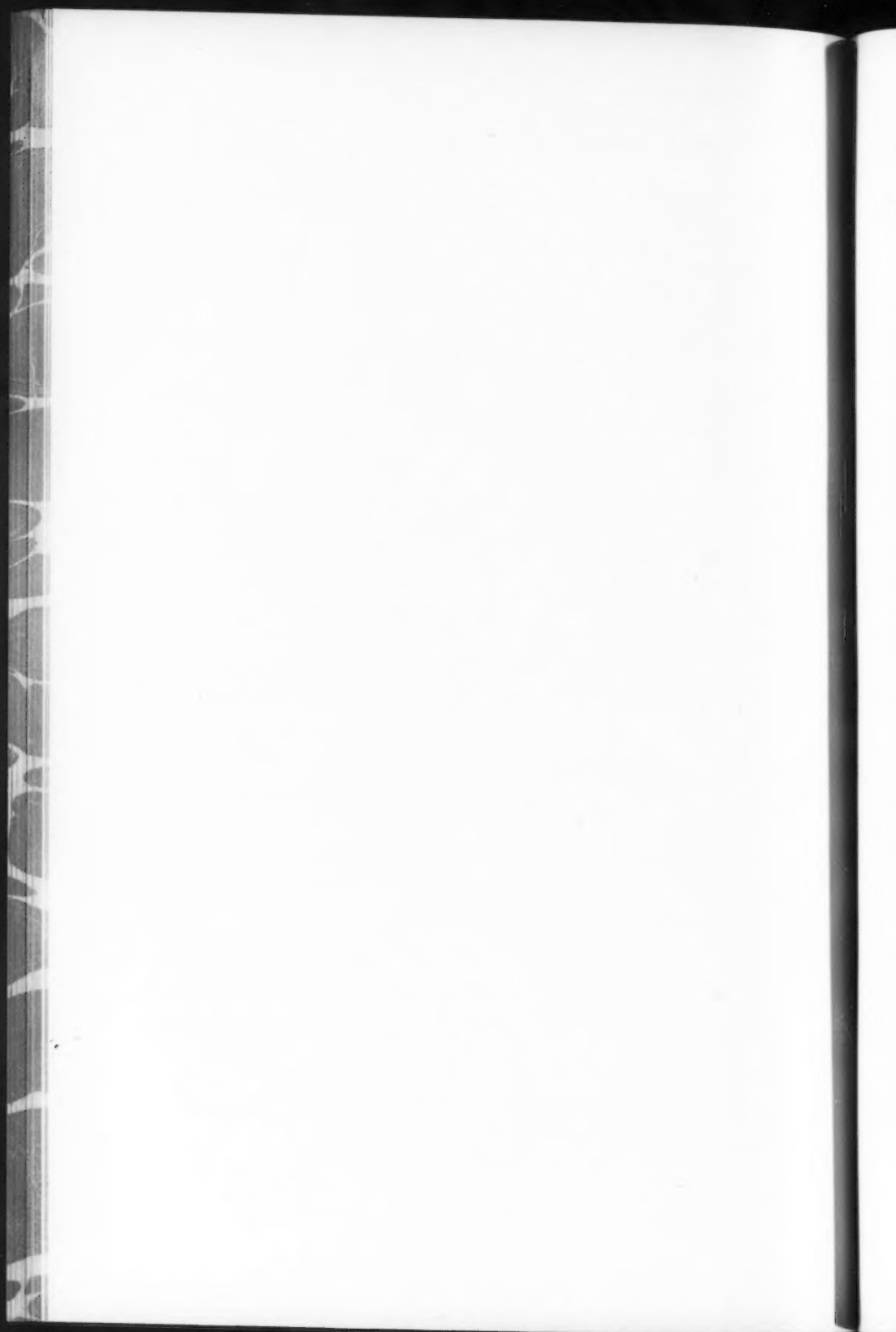
Bridges—(Continued).

- Bridge Foundations in the Columbia and Willamette Rivers near Portland, Oregon. Ralph Modjeski, M. Am. Soc. C. E. (Paper read before the Oregon Soc. of Engrs.) (1) Sept.
- Notes on the Design of Girder and Truss Spans and Trestle Work in Structural Steel. F. W. Dencer. (Paper read before the Eng. Soc. of Valparaiso Univ.) (86) Sept. 4.
- Some Notes on the Oakville Viaduct and the Dynamiting of the Condemned Arch Ribs, August 12, 1912.* C. H. Cunningham. (96) Sept. 5.
- Decorative Treatment of a Bridge over a Chicago Boulevard.* (13) Sept. 5.
- Rebuilding a Bridge Pier in a Cofferdam.* (14) Sept. 7.
- The Calcutta-Howrah Floating Bridge.* (12) Sept. 13.
- Electrically Operated Bascule Bridges, the Heel Trunnion Type.* (19) Sept. 14.
- The Hemlocks Concrete Masonry Dam at Bridgeport, Connecticut.* (14) Sept. 14.
- A Temporary Bridge Over the Passaic River, Newark.* (14) Sept. 14.
- Method of Constructing the Center for a 230-ft. Masonry Arch Built at Constantine, Algeria. (86) Sept. 18.
- Highway Bridges and Culverts.* C. H. Hoyt. (Abstract of *Bulletin* 43, U. S. Office of Public Roads.) (104) Sept. 20.
- Razing and Erecting Through Truss Bridges with an American Ditcher.* R. P. Black. (15) Sept. 20.
- An Automatic Bumper for Drawbridges.* (17) Sept. 21.
- Novel Bridge Erection in Santo Domingo.* (14) Sept. 21.
- A Temporary Single-Track Bascule Span.* (14) Sept. 21.
- Electrical Equipment for a Bascule Bridge.* C. H. Norwood. (15) Sept. 27.
- Note au Sujet de la Reconstruction du Pont de la Route Nationale No. 5 sur l'Oued-Harrach à Maison-Carrée.* Butavand. (43) July.
- Les Ponts de Constantine, Pont Suspendu de Sidi M'Cid.* Bolsnier. (43) July.
- Etude de la Solidarité des Pièces de Pont.* Henry Lossier. (33) Aug. 24.
- La Ligne D'Andolet à la Cluse par Morez et Sainte-Claude (Jura).* Maurice Honoré. (33) Sept. 14.
- Untersuchungen des Vereines deutscher Brücken- und Eisenbaufabriken mit Eisenkonstruktionen für den Brückenbau.* B. Stock. (48) July 13.
- Beiträge zur Berechnung von Bogendächern.* F. Kögler. (69) Aug.
- Die Bogenbrücke über den St. Croix-Fluss.* K. A. Müllenhoff. (69) Aug.
- Eisenbahnbrücke über den Südrarm des Sanagastromes in Deutsch-Kamerun.* F. Brunner. (69) Serial beginning Aug.
- Ueber Eisenbeton-Vorschiffen (Bridges).* (107) Aug. 10.
- Der Brückenkanal des Grossschiffahrtsweges Berlin-Stettin über der Berlin-Stettiner Eisenbahn.* Haessler. (40) Aug. 17.
- Tabellen für Strassenbrücken aus einbetonierten Walzträgern.* Otto Kommerell. (40) Aug. 28.

Electrical.

- Report of Committee 16 of the Am. Ry. Eng. Assoc. on Electricity.* (85) Vol. 13.
- High-Voltage Tests and Energy Losses in Insulating Materials.* E. H. Rayner. (77) July.
- The Supply and Transmission of Power in Self-Contained Road Vehicles and Locomotives.* J. C. Macfarlane and H. Burge. (77) July.
- Tariffs for Electrical Energy with Particular Reference to Domestic Tariffs.* W. W. Lackie. (77) July.
- A Simple Graphical Construction for Determining the Efficiency of a Polyphase Asynchronous Motor from the Current (Circle) Diagram.* John Nicholson. (77) July.
- The Tungsten Filament Lamp on Alternating Current.* Lancelot W. Wild. (77) July.
- Power Station Working.* J. W. Jackson. (77) July.
- High-Tension Porcelain Line Insulators.* (77) July.
- A Portable Electrical Instrument for the Detection of Combustible Gases and Vapours in Air.* Louis J. Steele. (77) July.
- Street Lighting. J. M. Bryant and H. G. Hare. (From *Bulletin*, Eng. Exper. Station, Univ. of Illinois.) (10) Aug.
- Cost of Isolated Plant Power.* Paul A. Bancel. (98) Aug.
- 120-Ton Electric Travelling Crane.* (12) Aug. 30.
- Electricity in Construction Work.* (73) Aug. 30.
- Transforming Stations of Niagara Electrochemical and Electrometallurgical Industries. A. J. Jones. (Paper read before the Am. Electrochemical Soc.) (73) Aug. 30.
- Electricity Supply in Sheffield.* (26) Serial beginning Aug. 30.
- New Electrical Generating Station at Britannia Works, Middlesbrough.* (12) Aug. 30.
- The Electrical Precipitation of Suspended Matter in Gases.* W. W. Strong. (3) Sept.
- Street Lighting in Toronto, Ontario.* K. L. Aitken. (27) Sept. 7.
- Keokuk-St. Louis Transmission Line.* (27) Sept. 7.

*Illustrated.



Electrical—(Continued).

- Radiant Efficiency of the Carbon Arc Lamp.* William H. Damon and William J. Enders. (27) Sept. 7.
- Control of Small Electric Furnaces. Charles Burton Thwing. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
- The Scientific Theory and Outstanding Problems of Wireless Telegraphy.* J. A. Fleming. (Paper read before the British Assoc.) (11) Sept. 13; (26) Sept. 13; (73) Sept. 13.
- The Production of Electrical Oscillations by Spark-Gaps Immersed in Running Liquids.* H. W. Eccles and A. J. Makower. (Paper read before the British Assoc.) (11) Sept. 13; (73) Sept. 13.
- Norwich Electricity Works and the Flood.* (26) Sept. 13.
- A Magnetic Shunt Vibration Galvanometer. Henry Tinsley. (73) Sept. 13.
- The Fery Bomb Calorimeter.* Robert S. Whipple. (Paper read before the British Assoc.) (73) Sept. 13; (11) Sept. 20.
- The Vibrations of Telephone Diaphragms.* Charles F. Meyer and J. B. Whitehead. (19) Serial beginning Sept. 14.
- Electrical Features of Some Chicago Office Buildings.* (27) Sept. 14.
- The Impedance of Telephone Receivers as Affected by the Motion of Their Diaphragms.* A. E. Kennelly and G. W. Pierce. (27) Sept. 14; (26) Sept. 13; (73) Sept. 13.
- The Hysteresis Loss in Iron Due to a Combined Pulsating and Rotating Magnetic Field.* Thomas F. Wall. (Paper read before the British Assoc.) (73) Sept. 20.
- The Quartz Mercury Vapor Lamp.* (73) Sept. 20.
- The Use of Mica in the Insulation of Electrical Apparatus. A. P. M. Fleming and R. Johnson. (26) Serial beginning Sept. 20.
- Some Unique Electromagnets.* (From *Electrical Review and Western Electrician*.) (47) Sept. 20.
- Characteristics of Metal Filaments.* Daniel H. Ogley. (26) Sept. 20.
- Electricity in Harper Memorial Library.* (27) Sept. 21.
- Minimizing Sparking in Direct-Current Machinery. Jens Bache-Wüg. (27) Sept. 21.
- Reinforced Cement and Concrete Poles for Overhead Electric Lines. Alfred Still. (27) Sept. 28.
- The Crank Diagram for Representation of Electrical Power.* Albert A. Nims. (27) Sept. 28.
- Farm Electric Lighting by Wind Power.* Putnam A. Bates. (46) Sept. 28.
- Tungsten Car Lighting by the Bay State Street Railway.* (17) Sept. 28.
- Résistance Electrique des Aciers Spéciaux.* O. Boudouard. (93) Apr.
- L'Oliothographe. G.-A. Andrault. (92) July.
- Belastungsausgleich in elektrischen Kraftwerken (Pufferung). A. Schwalger. (41) Serial beginning Aug. 15.
- Die Verwendung von Wärmespeichern und deren Konstruktion.* Ad. Rittershausen. (41) Aug. 22.
- Das neue Fernsprech-Vermittlungsamt in Mainz.* Blohmer. (41) Serial beginning Aug. 22.
- Ueber eine neue Metaldampflampe mit weissen Licht.* M. Wolfke. (41) Sept. 5.
- Neuere Kabelschutzhüllen und Abdeckungen.* J. Schmidt. (14) Serial beginning Sept. 5.
- Ueber einen elektrolytischen Kondensator und seine Anwendung für funkenlosen Kontakt. Karl Siegl. (41) Sept. 5.
- Ueber die Verlegung unterseeischer Telegraphenkabel und das deutsche Kabel nach Südamerika. Karl Willy Wagner. (40) Serial beginning Sept. 12.
- Ueber den Stand der Sicherheitsfrage. Hundhausen. (41) Sept. 12.
- Versuche mit der autom. Vakuumschnellbremse auf der elektr. Montreux-Oberland-Bahn.* R. Zehnder Spörri. (107) Sept. 14.
- Die Kraftversorgung des Kleingewerbes. E. Vollhardt. (41) Sept. 19.

Marine.

- Marine Use of Fuel Oil. J. H. Hopps. (55) Vol. 33.
- Electrical Equipment for the Propulsion of the U. S. A. Collier *Jupiter*. Eskil Berg. (From *General Electric Review*.) (73) Aug. 30.
- The German Motor-Driven Ship *Monte Penedo*. (11) Sept. 6; (12) Aug. 30.
- The *Monte Penedo's* Engines.* (12) Sept. 6.
- The Imperial German Cruiser *Goeben*.* (12) Sept. 6.
- Electric-Propulsion Equipment of the U. S. Collier *Jupiter*.* (13) Sept. 12.
- Paint Tests on the U. S. Receiving Ship *Hancock*.* Henry Williams. (13) Sept. 12.
- Suction Between Vessels. A. H. Gibson and J. Hannay Thompson. (Paper read before the British Assoc.) (12) Sept. 20.
- Marine Propulsion by Electric Transmission.* Henry A. Mavor. (Paper read before the British Assoc.) (26) Sept. 20; (11) Sept. 20; (12) Sept. 20.

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Marine—(Continued).

- Lifeboats on Ocean-Going Ships and Their Manipulation.* Axel Welin. (Paper read before the British Assoc.) (11) Sept. 20.
 Sulzer Diesel Engined Ship for New York-Rio Service.* J. Rendell Wilson. (95) Oct.
 City of Detroit 3; World's Largest Side Wheel Steamer.* (95) Oct.
 United States Battleships *Wyoming* and *Arkansas*.* Henderson B. Gregory. (95) Oct.
 Motor Ship *Eavestone* Fitted with Carels Diesel Engines.* (95) Oct.
 Note sur l'Ecluse Bellot-Tancarville au Port du Havre.* Guiffart. (43) July.
 La Prévention des Collisions en Mer, par l'Emploi d'Ondes à Basse Fréquence Système de Sir Hiram Maxim.* (33) Sept. 7.
 Das Schiffshebewerk mit Seitenschwimmern, Zahnstagen und Riegeln.* Fr. Jebens. (81) 1912, Pt. 5.
 Die Einrichtung des neuen Schwimmdocks der Oesterreichisch-ungarischen Kriegsmarine.* R. Dub. (48) Serial beginning Aug. 3.

Mechanical.

- Some Problems of the Cement Industry. Walter S. Landis. (55) Vol. 32.
 The Edison Roll Crushers.* W. H. Mason. (55) Vol. 33.
 Power and Heat Distribution in Cement Mills. L. L. Griffiths. (55) Vol. 33.
 Discussion on Cement Manufacture. (55) Vol. 33.
 The Assembly of Small Interchangeable Parts.* John Calder. (55) Vol. 33.
 The Process of Assembling a Small and Intricate Machine.* Halcolm Ellis. (55) Vol. 33.
 Milling Cutters and Their Efficiency.* A. L. De Leeuw. (55) Vol. 33.
 Tests of a Sand-Blasting Machine.* Wm. T. Magruder. (55) Vol. 33.
 Die Castings.* Amasa Trowbridge. (55) Vol. 33.
 Variable-Speed Power Transmission.* George H. Barrus and Chas. M. Manly. (55) Vol. 33.
 Oil Engines.* H. R. Setz. (55) Vol. 33.
 Test of an 85-H. P. Oil Engine. Forrest M. Towl. (55) Vol. 33.
 Design Constants for Small Gasoline Engines.* William D. Ennis. (55) Vol. 33.
 Economy of 1000 K. W. Natural Gas Engine, Tests, Construction and Working Costs.* Edwin D. Dreyfus and V. J. Hultquist. (55) Vol. 33.
 Some Experiences with the Pitot Tube on High and Low Air Velocities.* Frank H. Kneeland. (55) Vol. 33.
 Producer Gas from Crude Oil. E. C. Jones. (55) Vol. 33.
 Oil Fuel for Steam Boilers.* B. R. T. Collins. (55) Vol. 33.
 The Economic Importance of the Farm Tractor. L. W. Ellis. (55) Vol. 33.
 The Purchase of Coal. Dwight T. Randall. (55) Vol. 33.
 Energy and Pressure Drop in Compound Steam Turbines.* Forrest E. Cardullo. (55) Vol. 33.
 The Pressure-Temperature Relations of Saturated Steam.* Lionel S. Marks. (55) Vol. 33.
 Pressure-Recording Indicator for Punching Machinery.* Gardner C. Anthony. (55) Vol. 33.
 Tests of Large Boilers at the Detroit Edison Company.* D. S. Jacobus. (55) Vol. 33.
 Strain Measurements of Some Steam Boilers Under Hydrostatic Pressure.* James E. Howard. (55) Vol. 33.
 Herringbone Gears. Percy C. Day. (55) Vol. 33.
 The Dust Problem in Portland Cement Plants and Its Solution. Otto Schott. (55) Vol. 33.
 Electrical Power in Cement Plants. Frederick H. Lewis. (55) Vol. 33.
 The Core Room: Its Equipment and Management.* Henry M. Lane. (55) Vol. 33.
 Furnace Arrangement for Fuel Oil. C. R. Weymouth. (55) Vol. 33.
 Atomization of Oil. A. M. Hunt. (55) Vol. 33.
 Size of Stacks with Fuel Oil. K. G. Dunn. (55) Vol. 33.
 Commercial Application of the Turbine Turbo-Compressor.* Richard H. Rice. (55) Vol. 33.
 Power Forging, with Special Reference to Steam Hydraulic Forging Presses.* Barthold Gerdaud and George Mesta. (55) Vol. 33.
 The Influence of Heat on Hardened Tool Steels, with Special Reference to the Heat Generated in Cutting Operations.* Edward G. Herbert. (71) Vol. 85.
 Note on the Welding Up of Blowholes and Cavities in Steel Ingots.* J. E. Stead. (71) Vol. 85.
 Steam Engines for Driving Reversing Rolling-Mills.* John W. Hall. (71) Vol. 85.
 Modern Rock-Crushing Machinery.* John S. Franklin. (10) Aug.
 Welding as a Caulking Process.* James Steelman. (10) Aug.
 Superheating.* C. R. D. Meier. (98) Aug.
 The Strength of Rotating Discs.* (11) Aug. 30.
 Formulae Connecting the Pressure and Temperature of Saturated Steam. S. Godbeer. (11) Aug. 30.

* Illustrated.



Mechanical—(Continued).

- Coking Practice in the South Wales District.* R. H. Greaves. (Paper read before the British Foundrymen's Assoc.) (47) Aug. 30.
- Steam Boiler Efficiency. Edward A. Vehling. (Abstract of paper read before the Am. Master Mechanics' Assoc.) (47) Aug. 30.
- Details of 30-Ton Electrically Operated Traverser with Revolving Table.* (11) Aug. 30.
- Superheating—Its Economy and the Design of Superheaters to Secure Adjustment and Control of Steam Temperature.* (94) Sept.
- A New Method of Testing Boilers.* A. L. Haas. (94) Sept.
- The Technique of Gas Manufacture. Alfred E. Forstall. (3) Sept.
- Electricity in the Portland Cement Industry. F. C. E. Burnett. (42) Sept.
- The Plant of the Crescent Portland Cement Company.* W. B. Ruggles. (67) Sept.
- Sand-Lime Brick: How Manufactured and Used.* (67) Sept.
- Notes on Producer Gas Power.* H. F. Smith. (4) Sept.
- Some Studies of Welds. E. F. Law, W. H. Merriott, and W. P. Digby. (From *The Locomotive*.) (108) Sept.
- Hydraulic Pipe Bending Machines.* A. L. Monrad. (108) Sept.
- Cost Questions and the Motor Truck.* R. W. Hutchinson, Jr. (76) Sept. 1.
- The Storage, Deterioration, and Spontaneous Combustion of Coal.* Almea. (66) Sept. 3.
- A Comparison of Efficiencies and Costs of Steam, Water, Gas and Oil Power Generation.* Seth A. Moulton. (From Report, Maine State Water Storage Comm.) (86) Sept. 4.
- A Shoveling Machine for Loading and Handling Loose Material.* (13) Sept. 5.
- Combustion of Nitrogen in Coke-Oven Gas.* (11) Sept. 6.
- 12 000 I. H. P. Vertical Rolling Mill Engines.* (12) Sept. 6.
- The Leskole Optical Pyrometer.* (20) Sept. 6.
- Producer Gas Investigations. R. H. Fernald and C. H. Smith. (From *Bulletin No. 13*, U. S. Bureau of Mines.) (47) Sept. 6; (10) Aug.
- Experience with Lignite in Texas Central Stations. (27) Sept. 7.
- Power Plant for a Large Industrial Establishment.* Charles F. Bowen. (14) Sept. 7.
- Automatic Street Lighting and Extinguishing.* George Keillor. (Paper read before the North British Assoc.) (66) Sept. 10.
- Gas-Governors: Their Action and Application.* W. Carmichael Peebles. (Paper read before the North British Assoc.) (66) Sept. 10.
- Carbonization.* Harold G. Colman. (Paper read before the North British Assoc.) (66) Sept. 10.
- The Physical and Chemical Properties of Portland Cement. W. C. Reibling and F. D. Reyes. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
- The Control of Dust in Portland Cement Manufacture by the Cottrell Precipitation Processes. Walter A. Schmidt. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
- The Edison Giant Crushing Roll, Details of an Installation at the National Limestone Company's Plant.* J. F. Springer. (20) Sept. 12.
- Note on the Gas-Turbine. Dugald Clark, M. Inst. C. E. (Paper read before the British Assoc.) (11) Sept. 13; (12) Sept. 20; (26) Sept. 20; (47) Sept. 20; (66) Sept. 17; (73) Sept. 13.
- Manufacture of Seamless Steel Boiler Tubes.* J. Jay Dunn. (47) Sept. 13.
- Oil Engines for Marine and Land Purposes. C. Lakin-Smith, M. Inst. E. E. (Paper read before the Olympia Oil Industries Exhibition.) (47) Sept. 13.
- The Flying Boat and Its Possibilities.* Carl Dienstbach. (46) Sept. 14.
- The Gnome Rotary Engine.* Earle L. Ovington. (46) Sept. 14.
- Measurement of Natural Gas with Pitot Tubes.* C. Oliphant. (Paper read before the Natural Gas Assoc.) (83) Sept. 16.
- Some Phases of Present-Day Gas Lighting. C. H. Wiggers. (Paper read before the Wisconsin Gas Assoc.) (24) Sept. 16.
- Maintaining Service During Extreme Cold (Gas). D. E. Callender. (Paper read before the Wisconsin Gas Assoc.) (24) Sept. 16.
- Manufacture of Balloon Gas from Natural Gas.* F. F. Schauer. (Paper read before the Natural Gas Assoc.) (83) Sept. 16.
- Depreciation of Natural Gas Properties. V. A. Hays. (Paper read before the Natural Gas Assoc.) (83) Sept. 16.
- Efficiency of Gas Compressors.* P. F. Walker. (Paper read before the Natural Gas Assoc.) (83) Sept. 16.
- The New Allis-Chalmers Engine.* (64) Sept. 17.
- The Eyer mann Steam Turbine.* Wilhelm H. Eyer mann. (From *Kraftmaschinenbau*.) (64) Sept. 17.
- A Foundry Four Stories in Height.* (20) Sept. 19.
- Economies in Foundry Mixing and Melting.* Stuart Dean. (20) Serial beginning Sept. 19.

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- Design and Construction of Smokestacks.* Henry V. Feder. (From *Building Progress*.) (96) Sept. 19.
- The Distribution of Pressure on Inclined Aero-Curves.* A. P. Thurston. (Paper read before the British Assoc.) (11) Sept. 20.
- Gain in Power Obtained by Using Jet Condenser with a Simple Engine. Guy L. Andrews. (Paper read before the Stationary Engrs.) (62) Sept. 23.
- Limitations of Reducing Wheels.* Julian C. Smallwood. (64) Sept. 24.
- Before and After Taking in a Charge.* Cecil P. Poole. (64) Sept. 24.
- Increasing Steam Boiler Efficiency.* George H. Gibson. (20) Sept. 26.
- The Largest Testing Machine in the World.* Thorsten Y. Olsen. (14) Sept. 28.
- Operation of Argentina Tramway.* C. A. Tupper. (16) Sept. 28.
- Treating Tool Steel by Electricity. C. A. Shaffer. (Abstract of paper read before the Railway Tool Foremen's Assoc.) (62) Sept. 30.
- By-Products in Gas Manufacture.* Charles E. Munroe. (Paper read at the Centenary Celebration.) (83) Oct. 1.
- High Pressure Gas Lighting. F. W. Goodenough, Oscar Klatte and R. N. Zeek. (Paper read before the Illuminating Eng. Soc.) (83) Oct. 1.
- The Electrical Separation of Tar from Coal Gas.* Alfred H. White. (Paper read before the Michigan Gas Assoc.) (83) Oct. 1.
- Steam Power Plant Piping Materials. Wm. F. Fischer. (64) Oct. 1.
- San Francisco Gas Rates. (83) Oct. 1.
- Les Applications Electriques de la Métallisation Système Schoop.* F. Loppe. (93) Apr.
- L'Allumage Electrique des Moteurs à Explosions et ses Récents Progrès. R. Arnoux. (32) June.
- Observations sur la Communication de M. Rateau. G. Eiffel. (32) June.
- Le Comparateur Dixi.* Marre. (92) July.
- Technique Moderne de l'Industrie du Gaz.* R. Masse. (92) July.
- Nouvelle Bombe Calorimétrique.* Ch. Féry. (92) July.
- Les Nouvelles Recherches Expérimentales sur la Résistance de l'Air et l'Aviation faites aux Laboratoires du Champs de Mars et d'Auteuil.* G. Eiffel. (32) July.
- Appareil et Expériences d'Aérodynamique de 1909.* A. Rateau. (32) July.
- Les Méthodes Expérimentales Concernant les Volutures et les Hélices Aériennes.* Rodolphe Soreau. (32) July.
- Examen de la Méthode de M. J.-Paul Clayton pour l'Etude Expérimentale de la Machine à Vapeur à Piston. V. Dwelshauvers-Dery. (37) Aug. 31.
- Phénomènes de Résonance dans la Conduite d'Aspiration des Compresseurs et des Moteurs à Gaz.* P. Voissel. (37) Aug. 31.
- Etude des Amortisseurs d'Automobiles.* N. Duaner. (33) Aug. 31.
- Fours pour les Menus Travaux de Forge et d'Outilsage.* (34) Serial beginning Sept.
- Considérations Générales sur l'Industrie des Fours à Coke à Régénération de Chaleur.* Eugene Lecocq. (93) Sept.
- Machines Soufflantes d'Acieries Construites par la Maison Lefflaive et Cie.* Ch. Dantin. (33) Sept. 7.
- La Fabrication de Gaz Pauvre par Distillation Pyrogénée des Boues de Fosses Septiques. Lucien Cavié. (33) Sept. 21.
- Chaudières Aquatubulaires avec Foyers Automatiques à Propulsion Intérieure.* (33) Sept. 21.
- Maschinelle Aufbereitung des Formsandes in Giessereien.* Eduard Müller. (48) July 20.
- Neue Versuche über die Stickstoffverbrennung in Explodierenden Gasgemischen.* F. Hauser. (48) July 20.
- Die Kesselbekohlungsanlage der Zeche Zollern II der Gelsenkirchener Bergwerks-A.-G. A. Pietrkowski. (48) July 20.
- Strömungswiderstände in den Steuerungsventilen einer Kolbendampfmaschine.* E. Heinrich. (48) July 27.
- Krupp, 1812 bis 1912.* Conrad Matschoss. (48) Aug. 10.
- Ueber interessante Erscheinungen in Stahlblocken während des Auswalzens.* Karl Neu. (50) Aug. 15.
- Pressgas oder Bogenlicht für Strassen-Beleuchtung (Cost). (41) Aug. 22.
- Neuere Rohsengießmaschinen.* R. Schmid. (50) Aug. 29.
- Die Selbstschwebefähre der Cultuur Mij. Panggoonredjo über den Metro-ravyn bei Kepandjen auf Java.* (53) Aug. 30.
- Hängebahnen in Güterschuppen.* (40) Aug. 31.
- Niederrheinische Braunkohle im Martinwerksbetrieb.* Oskar Simmersbach. (50) Sept. 5.
- Ueber rotierende Luftpumpen und rotierende Kondensatoren.* Emil Gutmann. (53) Serial beginning Sept. 6.
- Ausnutzung der Koksofengase zur Gewinnung von Salpetersäure aus dem Stickstoff der Luft.* O. Döbelstein. (50) Sept. 19.
- Die Kraftversorgung des Kleingewerbes. E. Vollhardt. (41) Sept. 19.
- Einfluss des Dampfzustandes auf die Leistung und den Wärmeverbrauch der Kolbenmaschinen.* Hybl. (53) Sept. 20.

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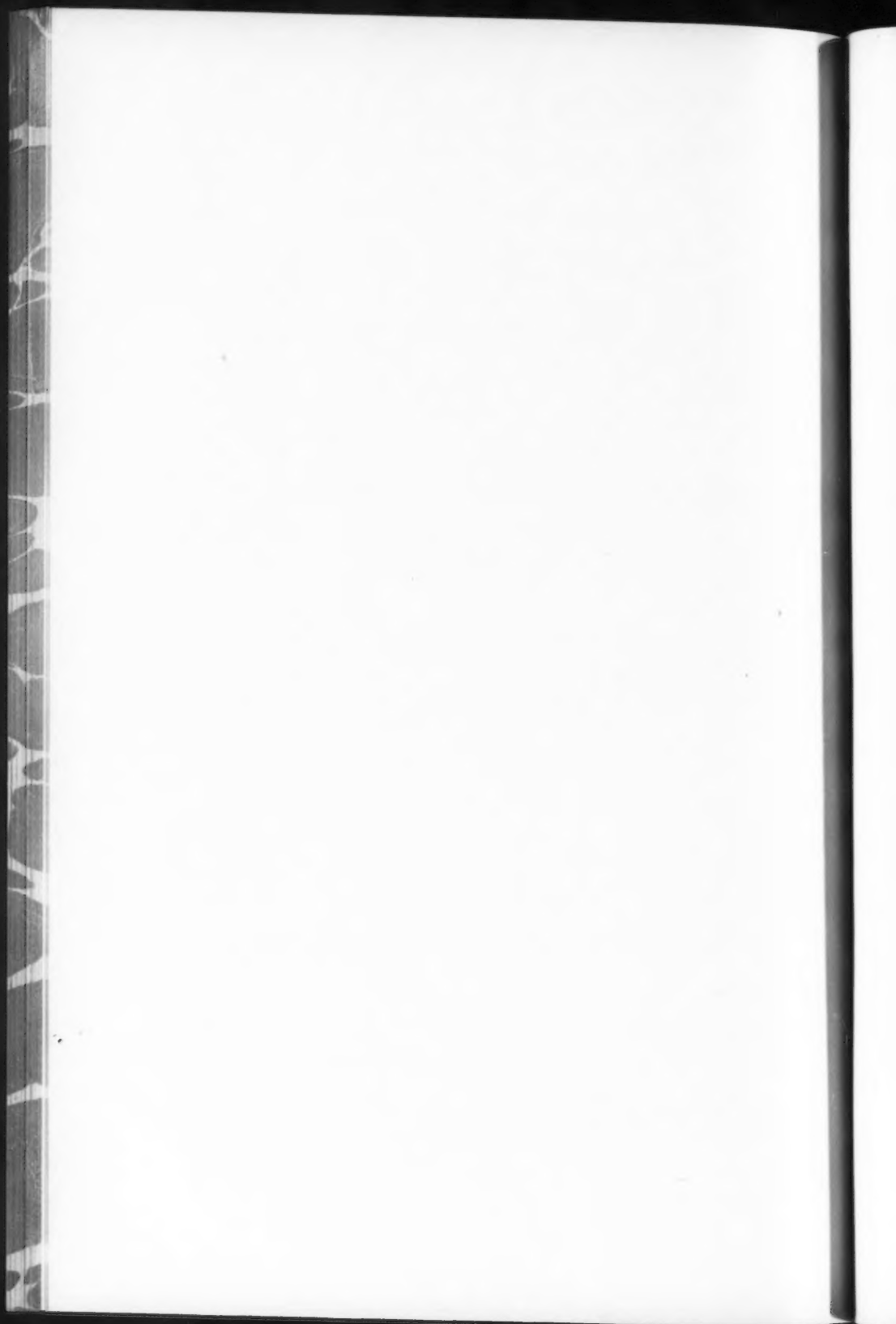
Metallurgical.

- Reciprocating Blast-Furnace Blowing Engines.* W. Trinks. (55) Vol. 33.
 Notes on a Bloom of Roman Iron Found at Corstopitum (Corbridge).* Sir Hugh Bell. (71) Vol. 85.
 The Chemical and Mechanical Relations of Iron, Vanadium, and Carbon.* J. O. Arnold and A. A. Read. (71) Vol. 85.
 Notes on the Solubility of Cementite in Hardenite.* John Oliver Arnold and Leslie Aitchison. (71) Vol. 85.
 Improvements in Electric Furnaces and Their Application in the Manufacture of Steel. Hans Nathusius. (71) Vol. 85.
 Manufacture and Treatment of Steel for Guns.* L. Cubillo. (71) Vol. 85.
 Steels Made in the Electric Furnace.* E. F. Lake. (10) Aug.
 Experiments in the Reduction of Iron Ore at Herrang in Sweden.* G. Grondal. (From *Jernkontoret Annaler*.) (22) Aug. 30.
 The Production of Black Nickel. (From the *Brass World*.) (47) Sept. 6.
 Electric Smelting of Iron Ore. E. F. Burchard. (103) Sept. 7.
 Malleable Casting Practice. Richard Moldenke. (Paper read before the Inter. Assoc. for Testing Materials.) (20) Sept. 12.
 Making Copper-Clad Steel Products.* (20) Sept. 12.
 Reduction of Iron Ores in the Electric Furnace. D. A. Lyon. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
 Notes on Bag Filtration Plants.* Anton Eilers. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
 The Development of the Reverberatory Furnace for Smelting Copper Ores. E. P. Mathewson. (Paper read before the Inter. Congress of Applied Chemistry.) (105) Sept. 12.
 The Sulphatizing Roasting of Copper Ores and Concentrates. Utley Wedge. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
 Heat Losses in Electric Furnaces. F. A. J. FitzGerald. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
 Electric Heating and the Removal of Phosphorus from Iron. Albert E. Greene. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
 The Slag in Electric Steel Refining. Richard Amberg. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
 Iola Cyanide Mill, Candor, N. C.* Percy E. Barbour. (16) Sept. 14.
 Comparative Method of Screen Analysis. A. T. Tye. (103) Sept. 14.
 The Use of Vanadium in Steel Castings. Edwin F. Cone. (20) Sept. 19.
 Canvas Table Concentration in California.* A. H. Martin. (16) Sept. 21.
 Step-Bearing for Slime Agitator.* Douglas Waterman. (103) Sept. 21.
 New Mills at Algoma Steel Plant.* John A. Sommers. (20) Sept. 26.
 Lead Salts in Cyanide Treatment. J. E. Clennell. (16) Sept. 28.
 Nouvelles Recherches sur le Point Critique des Alliages Cuivre-Zinc à 470°.* H. C. H. Carpenter. (93) Apr.
 Récentes Recherches sur les Laitons, un Nouveau Point Critique des Alliages Cuivre-Zinc son Interprétation et son Influence sur les Propriétés.* H. C. Carpenter et C. A. Edwards. (93) Apr.
 La Production de la Fonte au Four Electrique en Suède, Compte-Rendu des Expériences de Trollhättan.* Paul Nicou. (93) Apr.
 Expériences sur la Desaimantation des Aciers au Chauffage.* Félix Robin. (32) June.
 La Galvanoplastie du Nickel sous de Grandes Epaisseurs. M. A. Hollard. (92) July.
 Principes du Grillage de la Blende.* W. Hommel. (93) Sept.
 Das Gefüge des gehärteten Stahls.* H. Hanemann. (50) Serial beginning Aug. 22.
 Neuere Ergebnisse der elektrischen Rohelsenerzeugung auf dem Versuchswerk am Trollhättan.* B. Neumann. (50) Aug. 22.
 Die Bestimmung der Schlackeneinschlüsse im Stahl. G. Mars. (50) Sept. 19.
 Die chemische Technologie des rauchschwachen Pulvers mit besonderer Berücksichtigung der modernen Jagdpulver. Richard Schnayder. (53) Sept. 20.

Mining.

- The Production of Petroleum on the Pacific Coast. Arthur F. L. Bell. (55) Vol. 33.
 Comparative Evaporative Values of Coal and Oil. C. F. Wieland. (55) Vol. 33.
 The Relative Value of Light Oil as Compared with Fuel Oil. Joseph Nisbet Le Conte. (55) Vol. 33.
 Safety-Devices in Connexion with Electrical Machinery and Apparatus for Coal-Mines.* David Bowen and Walter E. French, Assoc. M. Inst. C. E. (106) Vol. 43, Pt. 5.
 A Rope-Driven Coal-Cutter.* Wilfrid L. Spence, Assoc. M. Inst. C. E. (106) Vol. 43, Pt. 5.
 Electricity in Stone Quarries and Gravel Pits.* (67) Sept.

*Illustrated.



Mining—(Continued).

- Refraction of Light in Firedamp.* O. H. Hahn. (From *Coal Age*.) (57) Sept. 6.
 Caving System in Chisholm District.* L. D. Davenport. (16) Serial beginning Sept. 7.
 A New Sulphur Operation in the South.* Richard H. Vail. (16) Sept. 7.
 Costs at the Erie Mine. S. H. Brockunier. (16) Sept. 7.
 Testing of Miners' Safety Lamps. (Report of the Departmental Committee.) (57) Sept. 13; (20) Sept. 13.
 The Coalmining Industry in the Hokkaido. H. Wrenacre. (Abstract from Report to the Board of Trade.) (57) Sept. 13.
 Churn Drilling in New Mexico.* I. J. Stauber. (16) Sept. 14.
 Gold-Dredging in the Boise Basin of Idaho.* John H. Miles. (103) Sept. 14.
 Crushing Plant and Sampling Mill of Reinforced Concrete.* K. E. Voorhes. (14) Sept. 14.
 Clay Mining Problem a Serious One.* Ellis Lovejoy. (76) Sept. 15.
 Clay Winning Problem in the East.* (Mining.) Allen E. Beals. (76) Sept. 15.
 Concrete Timbering for Mine Shafts.* E. R. Jones. (13) Sept. 19.
 Electric Winding Engines: A Comparison of Systems and the Influence of Drum Profile on the Performance Obtained.* A. E. du Pasquier. (Paper read before the South Wales Inst. of Engrs.) (22) Sept. 20; (57) Sept. 20.
 Further Notes on the Analyses of Mine Air Conducted at the Lewis Merthyr Consolidated Collieries.* J. W. Hutchinson and Edgar G. Evans. (Paper read before the South Wales Inst. of Engrs.) (57) Sept. 20; (22) Sept. 20.
 The Bessli Mine and Shisaka Smelter.* H. Foster Bain. (103) Sept. 21.
 Mining Problems at Santa Gertrudis.* W. G. Matteson. (16) Sept. 21.
 Detonator Troubles and Investigations on the Panama Canal. Arthur L. Robinson. (Abstract of paper read before the Inter. Cong. of Applied Chemistry.) (14) Sept. 21.
 The Technical Problems of Coal Preparation. W. S. Ayres. (Paper read before the Inter. Cong. of Applied Chemistry.) (19) Sept. 28.
 Surface Improvements at Ajax Mine.* S. A. Worcester. (16) Sept. 28.
 Generating Energy at Coal Mines.* (27) Sept. 28.

Miscellaneous.

- Report of Committee 19 of the Am. Ry. Eng. Assoc. on Conservation of Natural Resources. (85) Vol. 12, Pt. 3, and Vol. 13.
 The Turret Equatorial Telescope; A New Astronomical Observatory.* James Hartness. (55) Vol. 33.
 Specifications. Fred S. Sells. (77) July.
 La Thermométrie et la Pyrométrie Industrielles.* Eugène Grandmougin. (33) Serial beginning Sept. 7.

Municipal.

- Some Notes on Road Maintenance in County Armagh. R. H. Dorman, M. Inst. C. E. (Paper read before the Inst. of Municipal and County Engrs.) (104) Aug. 30.
 Scottish Roads. Allan Stevenson. (Paper read before the Inst. of Municipal and County Engrs.) (104) Aug. 30.
 Practical Road Building.* John N. Edy, Jun. Am. Soc. C. E. (60) Sept.
 Minor Problems of Tarred Roads. Francis G. Wickware. (60) Sept.
 Methods of Road Construction and the Problem of Dust Suppression.* Frank B. Earl. (Paper read before the Am. Soc. of Eng. Contractors.) (96) Sept. 5.
 Methods of Testing Roadmaking Materials in European Countries. A Mesnager. (Paper read before the Inter. Assoc. for Testing Materials.) (86) Sept. 11.
 The Strength of Wood for Pavements. M. P. Labordere and M. F. Anstett. (Paper read before the Inter. Assoc. for Testing Materials.) (96) Sept. 12.
 The Lake Front Park Extension in Chicago.* (13) Sept. 12.
 Improving Street Traffic Conditions in Newark, N. J.* F. Van Z. Lane. (13) Sept. 12.
 The Road Problem. Sir John H. A. Macdonald. (Paper read before the British Assoc.) (11) Sept. 20.
 Bitumen Content of Coarse Bituminous Aggregates. Prévost Hubbard. (14) Sept. 21; (86) Sept. 4.
 Cost Data on State Aid Road in Alabama Constructed with Convict Labor.* R. P. Boyd. (86) Sept. 25.
 Some Maintenance Costs of English Roads. (86) Sept. 25.
 Progress Report on the Nelson Ave. Experimental Road of the State Highway Department of Ohio. (86) Sept. 25.
 Experimental Road Construction on Sandy Soil.* (86) Sept. 25.
 Life and Cost of Asphalt Pavements.* G. H. Norton. (13) Sept. 26.
 Some Important Street Improvements in Pittsburgh.* (13) Sept. 26; (86) Sept. 25.
 Concrete Pavements; Their Advantages and Disadvantages.* P. E. Green. (13) Sept. 26.

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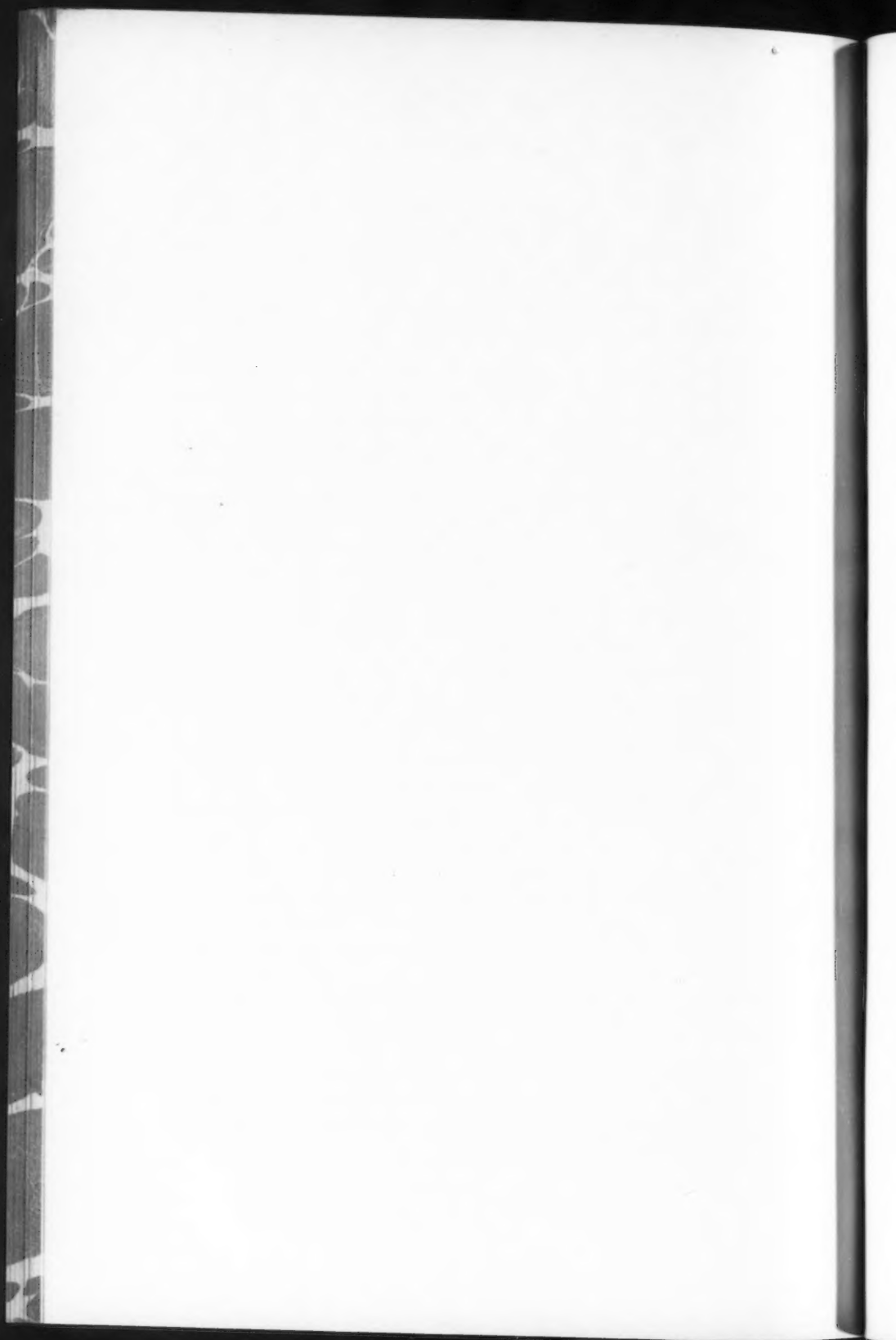
Municipal—(Continued).

- Work of New Jersey's State Department of Public Roads; Organization Scheme and Experience with Various Types of Construction.* (14) Sept. 28.
 Recent Field Work of the Massachusetts Highway Commission.* (14) Sept. 28.
 Road Treatment with Asphalt Binder and Sand. (14) Sept. 28.
 Essai d'un Nouveau Mode de Compression des Rechargements Généraux d'Empierrements.* Van Volsom. (30) Aug.
 Nouveau Système Economique de Rechargement des Chaussées Empierrées. A. Sallé. (35) Sept.
 Der Elbtunnel in Hamburg und sein Bau.* O. Stockhausen. (48) Serial beginning Aug. 17.
 Teer als Baumaterial für Stadtstrassen. D. Scheuerman. (39) Aug. 20.

Railroads.

- Report of Committee 12 of the Am. Ry. Eng. Assoc. on Rules and Organization. (85) Vol. 12, Pt. 1.
 Report of Committee 10 of the Am. Ry. Eng. Assoc. on Signals and Interlocking. (85) Vol. 12, Pt. 1, and Vol. 13.
 Report of Committee 18 of the Am. Ry. Eng. Assoc. on Electricity.* (85) Vol. 12, Pt. 1.
 Report of Special Committee of the Am. Ry. Eng. Assoc. on Brine Drippings from Refrigerator Cars. (85) Vol. 12, Pt. 1.
 Report of Committee 14 of the Am. Ry. Eng. Assoc. on Yards and Terminals.* (85) Vol. 12, Pt. 1, and Vol. 13.
 Report of Committee 16 of the Am. Ry. Eng. Assoc. on Economics of Railway Location. (85) Vol. 12, Pt. 1.
 Report of Committee 2 of the Am. Ry. Eng. Assoc. on Ballast. (85) Vol. 12, Pt. 1, and Vol. 13.
 Report of Committee 3 of the Am. Ry. Eng. Assoc. on Ties.* (85) Vol. 12, Pt. 1, and Vol. 13.
 Report of Committee 5 of the Am. Ry. Eng. Assoc. on Track.* (85) Vol. 12, Pt. 1, and Vol. 13.
 Report of Committee 4 of the Am. Ry. Eng. Assoc. on Rails. (85) Vol. 12, Pt. 1; Vol. 12, Pt. 2, and Vol. 13.
 Drop Test of Rails, Deflection, Elongation and Compression of 85 Lb. Am. Soc. C. E., Open Hearth Rails in Drop Test.* C. S. Churchill. (85) Vol. 12, Pt. 2.
 Carbon and Deflection of Rails in Drop Test.* M. H. Wickhorst. (85) Vol. 12, Pt. 2.
 A Study of Forty Failed Rails.* W. C. Cushing. (85) Vol. 12, Pt. 2.
 A Study of Sixty-Eight Failed Rails.* W. C. Cushing. (85) Vol. 12, Pt. 2.
 Tests and Conclusions.* (On Rails). M. H. Wickhorst. (85) Vol. 12, Pt. 2.
 Ductility Tests of Rails under Specifications of the New York Central Lines.* P. H. Dudley. (85) Vol. 12, Pt. 2.
 Water Stations for Track Pans.* (Report of Committee, Am. Ry. Eng. Assoc.) (85) Vol. 12, Pt. 3.
 Description of One Pipe Circulation Method Track Pans as Installed by the Lake Shore and Michigan Southern Ry. Co., at Palmsville, Ohio.* H. H. Ross. (85) Vol. 12, Pt. 3.
 Report of Committee 17 of the Am. Ry. Eng. Assoc. on Wood Preservation.* (85) Vol. 12, Pt. 3.
 Note on the Strength of Ties Treated with Crude Oil. W. K. Hatt. (85) Vol. 12, Pt. 3.
 The Electrical Resistance of Timber as Affected by Treatment with Preservatives. J. T. Butterfield. (85) Vol. 12, Pt. 3.
 Report of Committee 9 of the Am. Ry. Eng. Assoc. on Signs, Fences and Crossings. (85) Vol. 12, Pt. 3, and Vol. 13.
 Report of Committee 1 of the Am. Ry. Eng. Assoc. on Roadway. (85) Vol. 12, Pt. 3, and Vol. 13.
 Rail Failure Statistics for One Year Ending Oct. 31, 1910 and 1909.* (Report of Committee on Rails, Am. Ry. Eng. Assoc.) (85) Vol. 13 and Vol. 12, Pt. 2.
 Comparative Wear of Bessemer Open-Hearth and Nickel Steel Rails on Pennsylvania Railroad. (Report of Committee on Rails, Am. Ry. Eng. Assoc.) (85) Vol. 13.
 Segregation and Other Rail Properties as Influenced by Size of Ingot.* M. H. Wickhorst. (85) Vol. 13.
 Tests of Rail Steel Ingots and Derivative Shapes Made at Watertown Arsenal.* M. H. Wickhorst. (85) Vol. 13.
 Specifications for Carbon Steel Rails. (Report of Committee, Am. Ry. Eng. Assoc.) (85) Vol. 13.
 A Study of Seventeen Good Service Rails.* Robert Trimble and W. C. Cushing. (85) Vol. 13.
 Equated Tonnage Rating for Locomotives.* M. H. Wickhorst. (Paper read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.

*Illustrated.



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- The Storage Battery in Railway Service. L. C. Fritch. (Paper read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.
- Gravel Washing Plant of the Richmond, Fredericksburg, Potomac and Washington Southern Railways.* S. B. Rice. (85) Vol. 13.
- Depth of Stone Ballast.* (Report of General Manager's Committee, Pennsylvania R. R. Co., read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.
- Gravel as Ballast.* C. B. Bräuning. (85) Vol. 13.
- Ballast. George W. Vaughan. (85) Vol. 13.
- Influence of Rolling Temperature on the Properties of Bessemer Rails.* M. H. Wickhorst. (85) Vol. 13.
- The History, Development and Use of Rails by Railroad Companies of the United States from 1830 to date. P. H. Dudley. (Paper read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.
- Steel Rails, Investigations by the American Society of Civil Engineers. Thos. H. Johnson. (Paper read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.
- The Question of the Improvement of Rail Design and Specifications from 1893 to the Present Time. W. C. Cushing. (Paper read before the Am. Ry. Eng. Assoc.) (85) Vol. 13.
- Locomotive Practice in the Use of Fuel Oils.* Howard Stillman. (55) Vol. 33.
- Marshall's Fire-Box with Stayless Roof.* (11) Aug. 30.
- Atlantic Type Express Locomotive for the Chinese Government Railways.* (12) Aug. 30.
- New Locomotives for Italian State Railways. (12) Aug. 30.
- Balanced Compound Express Locomotive, Swiss Federal Railways.* (12) Aug. 30.
- Interlocking at Des Plaines, Ill. C. & N. W. Ry.* B. M. Meisel. (87) Sept.
- Engine House Equipment and Facilities. Ernest Cordeau. (25) Sept.
- Advantages and Disadvantages of Lead. J. F. Jennings. (Paper read before the Traveling Engrs. Assoc.) (25) Sept.
- Solid End Main Rod.* C. D. Ashmore. (25) Sept.
- Bridge Warnings (for Trainmen).* (21) Sept.
- New Balanced Compound Locomotives of the Prussian State Railways.* (21) Sept.
- Alternate Safety Loop for Tumbler End of Brake Push Rods on Existing Private Owners' Wagons.* (21) Sept.
- Notation and the Monorail Car.* Burt L. Newkirk. (3) Sept.
- Locomotive Fuel Consumption and the Speed Diagram. A. K. Shurtleff. (87) Sept.
- Kaw River Dike Crossing, Kansas City.* (87) Sept.
- New Experiments with Reinforced Concrete Sleepers.* Bloss. (From *Elektrische Kraftbetriebe und Bahnen*.) (88) Sept.
- The Electrification of the Railways. Biedermann. (From *Zeitung des Vereins-deutscher Eisenbahnverwaltungen*.) (88) Sept.
- The Results of Working the Railways in France, in England and in Germany, during 1910. C. Colson. (From *Revue politique et parlementaire*.) (88) Sept.
- Rail Anchor or Anti-Creeping Device on the C., B. & Q. R. R.* (13) Sept. 5.
- New 100-Lb. Rail Section; C. & N. W. Ry.* (13) Sept. 5.
- Vertical Curves, Spirals, and Connecting Spirals for Meter-Gage Railways.* Lee Fraser. (13) Sept. 5.
- The Progress of Italian Railways.* (12) Sept. 6.
- Chemically Treated Water and Increased Locomotive Efficiency.* (Paper read by Committee of the Traveling Engrs. Assoc.) (15) Sept. 6; (25) Sept.
- The Relation of Mechanical Appliances to Fuel Economy. (Paper read by Committee of the Traveling Engrs. Assoc.) (15) Sept. 6; (25) Sept.
- Handling Long Trains with Modern Air Brake Equipment. (Paper read by Committee of the Traveling Engrs. Assoc.) (15) Sept. 6; (25) Sept.
- Train Tonnage. J. M. Daly. (Paper read before the Traveling Engrs. Assoc.) (15) Sept. 6; (25) Sept.
- Testing Rails for Elongation and Ductility Under the Drop Testing Machine. P. H. Dudley. (Paper read before the Inter. Assoc. for Testing Materials.) (18) Sept. 7; (14) Sept. 21.
- Some Features of the American Rail Situation. J. P. Snow. (Paper read before the Inter. Assoc. for Testing Materials.) (18) Sept. 7.
- American Research Work on Rails, Conducted Jointly by Railroads and Steel Manufacturers. M. H. Wickhorst. (Paper read before the Inter. Assoc. for Testing Materials.) (18) Sept. 7; (20) Sept. 12; (14) Sept. 14.
- Notes on Features Associated with the Tests of Steel Rails. James E. Howard. (Paper read before the Inter. Assoc. for Testing Materials.) (18) Sept. 7.
- Reinforced Concrete Freight House, Chicago Great Western Ry., at Mason City, Iowa.* (18) Sept. 7.
- A Railway Car Driven by Gas and Electricity.* (46) Sept. 7.
- Grading a Heavy Section of the New Pittsburgh-Cleveland Line.* (14) Sept. 7.
- Physical and Operating Features of the East St. Louis & Suburban Railway.* (17) Sept. 7.

* Illustrated.



Railroads—(Continued).

- Factors in Railway Electrification. C. O. Mailloux. (Paper read before the Turin Inter. Elec. Congress.) (17) Sept. 7.
- A Steel Car Substation with an Automatic Power-Input Control.* C. L. Cadie. (17) Sept. 7.
- New Railway Transshipment Terminal; Advanced Cargo-Handling Methods at Montgomery Terminal in New Jersey.* H. McL. Harding. (14) Sept. 7.
- Use of Air Dump-Cars on Railway Construction.* Maurice E. Davis. (Abstract of paper read before Am. Soc. of Eng. Contractors.) (62) Sept. 9.
- The Simmen System of Railway Signalling and Dispatching.* Paul J. Simmen. (96) Sept. 12.
- The Dessau-Bitterfeld Railway.* (26) Sept. 13.
- Electrification of Oakland Suburban Lines.* R. T. Guppy. (15) Sept. 13.
- Comparative Service Tests of Locomotives.* (15) Sept. 13.
- Mallet Locomotive for the Virginian Railway.* (12) Sept. 13.
- Garratt Locomotives for the Tasmanian Government Railways.* (11) Sept. 13.
- Wheel and Erecting Shops, Chicago & Northwestern Ry., Chicago.* (18) Sept. 14.
- Simple Mallet Locomotives on the Canadian Pacific and Pennsylvania Roads.* (18) Sept. 14.
- Centering Side Bearings.* (17) Sept. 14.
- Standards for and Cost of Reinforced Concrete Pipe Culverts, Great Northern Ry.* W. B. Irwin. (86) Sept. 18.
- Locomotives with Five and Six Coupled Axles.* (13) Sept. 19.
- Rail Plateways. C. Noble Fell, A. M. Inst. C. E. (Abstract of paper read before the Soc. of Engrs.) (96) Sept. 19; (47) Sept. 6.
- Development in Steel Rails.* P. H. Dudley. (15) Sept. 20.
- An Interesting Method of Renewing Three Turntables with the Minimum Delay to Traffic.* (15) Sept. 20.
- Modern Crossing Design.* F. W. Rizer. (15) Sept. 20.
- Grading and Tracklaying with an American Ditcher.* (15) Sept. 20.
- Copper Zone vs. Nickel Zone as a Basis of Interurban Rates. George Eberle. (17) Sept. 21.
- Data from Road Tests of Advanced Types of Locomotives.* (18) Sept. 21.
- New Freight Transfer Station Operating with Electric Trucks.* (14) Sept. 21.
- Cost of Constructing a Reinforced Concrete Wharf for the Panama R. R.* (86) Sept. 25.
- Notes on a Costly Brazilian Railway Line.* A. E. Hess. (13) Sept. 26.
- Mallet Locomotives for the Great Northern.* (15) Sept. 27.
- The Buckwalter Electric Baggage Truck.* (15) Sept. 27.
- Physical Testing of Broken-Stone Ballast.* A. T. Goldbeck and F. M. Jackson. (Paper read before the Inter. Assoc. for Testing Materials.) (18) Sept. 28.
- New Signal System of Washington, Baltimore & Annapolis Railroad.* (17) Sept. 28.
- Three-Car Storage Battery Train.* (17) Sept. 28.
- Overhead Line Construction, Butte, Anaconda & Pacific Ry.* (18) Sept. 28.
- First Transcontinental Railroad in Australia.* C. O. Burge. (14) Sept. 28.
- Sur les Grues à Vapeur Employées dans les Accidents de Chemins de Fer.* A. Goupil. (43) July.
- Nouvelles Locomotives à Grande Vitesse à Quatre Cylindres, à Simple Expansion et Surchauffe, des Chemins de Fer de l'Etat français.* L. Pierre-Guédon. (33) Aug. 24.
- Note sur le Chauffage par la Vapeur Appliqué aux Voitures des Chemins de Fer du Midi.* Bachelery. (38) Sept.
- Les Chemins de Fer de la Banlieue de Bruxelles et la Jonction Nord-Midi.* Lionel Wiener. (38) Sept.
- Die Leistungsfähigkeit von Ablaufanlagen auf Verschlebbahnhöfen.* (40) Feb. 10.
- Störungen in Fernsprecheinrichtungen durch Wechselstrombahnen.* Georg Stein. (41) Aug. 15.
- Gotthardbahn und Giovi-Linie ueber Berechnungen und Messungen des Kraftbedarfs bei elektrischem Betrieb.* (107) Serial beginning Aug. 17.
- Ueber Gebirgsdruck.* E. Wiesmann. (107) Serial beginning Aug. 17.
- Signal- und Schaltanlage für elektrische Grubenbahnen mit Fahrdraht unter Tage.* M. Henke. (41) Aug. 22.
- Die Rutschungen in dem Abschnitte Ziersdorf-Eggenburg der Kaiser Franz Josef-Bahn (Hauptstrecke).* Hans Raschka. (53) Sept. 6.
- Vom Bau der Bodensee-Toggenburgbahn.* (107) Serial beginning Sept. 21.

Railroads, Street.

- A New Special-Work Layout for Street-Railway Track.* F. M. Johnson. (13) Sept. 5.
- Proposed Plans for an Independent Subway for the City of Chicago.* (86) Sept. 18.
- How the Chicago and Cleveland Street Railway Settlements are Working Out. Delos F. Wilcox. (Abstract of paper read before the National Municipal League.) (13) Sept. 19.

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Railroads, Street—(Continued).

- Sand on Electric Cars. W. H. Evans. (Abstract of paper read before the Illinois Elec. Ry. Assoc.) (17) Sept. 21.
 A New Center-Entrance Car for San Diego.* H. M'Nutt. (17) Sept. 21.
 Electric Railway Track Design and Construction in St. Louis.* (14) Sept. 21.
 Special Trackwork for City Electric Railways.* W. E. Turner. (From *Applied Science*.) (96) Sept. 26.
 Franklin Street Substation of the Metropolitan West Side Elevated Railway.* (17) Sept. 28.
 Brushes, an Analysis of the Requirements of the Satisfactory Brush for Railway Service. W. C. Kalb. (17) Sept. 28.
 Le Chemin de Fer de Hambourg.* Schimpff. (From *Zeitung des Ver. deutsch Eisenbahnverwalt.*) (43) July.
 Entwicklung, gegenwärtiger Stand und Aussichten des elektrischen Vollbahnwesens.* G. Soberski. (102) Serial beginning Aug. 15.
 Die Hamburger Hochbahn.* D. E. Günthel. (51) Serial beginning Aug. 17.

Sanitation.

- Waterway for Culverts. (Report of Committee, Am. Ry. Eng. Assoc.) (85) Vol. 12, Pt. 3.
 Rational Psychrometric Formulae, Their Relation to the Problems of Meteorology and of Air Conditioning.* Willis H. Carrier. (55) Vol. 33.
 Air-Conditioning Apparatus. Principles Governing Its Application and Operation. Willis H. Carrier and Frank L. Busey. (55) Vol. 33.
 The Physics of Air in Relation to Ventilation. A. Saxon Snell. (Paper read before the Royal Sanitary Inst. Congress.) (104) Serial beginning Aug. 30.
 Chemistry of Sewage Purification. Arthur Lederer. (4) Sept.
 Sewerage of Shelbyville, Ind.* (60) Sept.
 The Method of Estimating the Sewage Flow for the New Intercepting Sewer and Disposal Works at Fitchburg, Mass. David A. Hartwell and Harrison P. Eddy. (Report of Sewage Disposal Comm. of Fitchburg, Mass.) (86) Sept. 4.
 New Sewer Work at St. Louis, Mo.* W. W. Horner. (13) Sept. 5.
 Standard Tests of the Efficiency of Sewage Treatment. C. B. Hoover. (13) Sept. 5.
 Extension of an Outfall Sewer.* John S. Brodie, M. Inst. C. E. (Paper read before the Royal Sanitary Inst.) (96) Sept. 5.
 Country House Sewage Purification. John E. Tuke. (Paper read before the Royal Sanitary Inst.) (104) Serial beginning Sept. 6.
 Intercepting Traps in House Drains. (Report of the Departmental Committee.) (104) Sept. 6.
 Combined Sewer and Bridge in Denver.* (14) Sept. 7.
 Sewage Disposal Results at Leeds. (14) Sept. 7.
 Laying a Long Submerged Sewer Outlet.* (14) Sept. 7.
 The Destructor System of Refuse Disposal Recommended for Newark, New Jersey: By-Products and Power Utilization. J. C. Hallock and F. O. Runyon. (86) Sept. 11.
 The Disposal of Sewage Sludge. Arthur Hindle and P. Holt Whitaker. (Paper read before the Royal San. Inst. Cong.) (96) Sept. 12.
 Salford Sewage Works. J. Corbett. (104) Sept. 13.
 Construction of Isolation Hospitals. H. Franklin Parsons. (104) Sept. 13.
 British Practice in Sewage Disposal. Arthur J. Martin, M. Inst. C. E. (Paper read before the Royal Inst. of Public Health.) (104) Sept. 13.
 Plumbing and Heating in Nurses' Home.* (101) Sept. 13.
 Deodorizing Sewer Air at Winnipeg.* (14) Sept. 14; (96) Sept. 26.
 Wilkes-Barre's District Heating System.* Donald M. Belcher, Assoc. M. Am. Soc. C. E. (14) Sept. 14.
 Sewage Disposal at Fort Logan.* (14) Sept. 14.
 Car Ventilation. William J. Fleming. (Paper read before the Keystone Ry. Club.) (17) Sept. 14.
 Street Cleaning Methods and Costs in Several Ohio Cities. (From Report, Ohio State Board of Health.) (86) Sept. 18.
 Two Examples of Recent English Practice in Repairing Old Brick Sewers, Sewer Flushing Practice.* O. E. Winter. (Paper read before the Inst. of Municipal and County Engrs.) (86) Sept. 18.
 Experiments to Determine the Effect of Size and Depth of Broken Stone in Sprinkling Filters.* Calvin W. Hendricks. (Report to the Baltimore Sewage Exper. Station.) (86) Sept. 18.
 Sewage Treatment at Mt. Vernon, N. Y.* Charles A. Hammond. (13) Sept. 19.
 A Complete Sewage Disposal Plant for a Public Institution.* T. Lowes and T. Ald Murray. (Paper read before the Canadian Public Health Assoc.) (96) Sept. 19.
 Large Submerged Sewer Outlet.* John F. Skinner. (From *Municipal Journal of New York*.) (96) Sept. 19.

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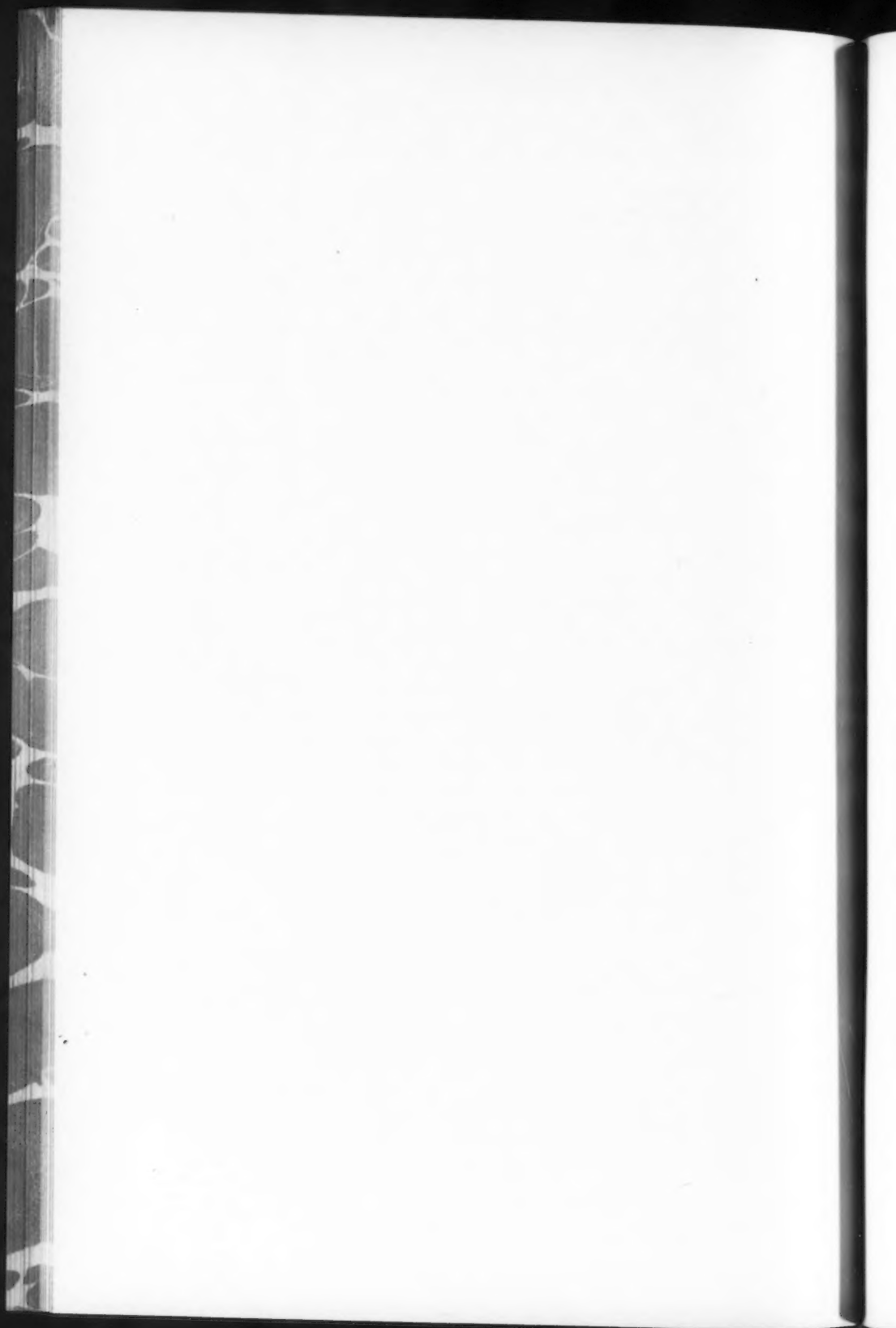
Sanitation—(Continued).

- An Experimental Investigation of the Transmission of Heat. Petavol and C. N. Lander. (Paper read before the British Assoc.) (11) Sept. 20.
- Heating and Ventilation of Small Theatre.* (101) Sept. 20.
- The Details of Designs of Culverts to Carry Surface Drainage from Gutter to Gutter Under Street Crowns at Street Intersections. Blair L. Boyle. (86) Sept. 25.
- Refuse Disposal Plants. J. C. Hallock and F. O. Runyon. (From *Municipal Journal of New York*.) (96) Sept. 26.
- An Electrolytic Sterilizing Plant.* (96) Sept. 26.
- Heat Transmission Through Metal Siding. (101) Sept. 27.
- Permissible Limits of Sewage Pollution as Related to New York Harbor. George A. Soper. (Paper read before the Am. Public Health Assoc.) (14) Sept. 28.
- Nouvelle Méthode d'Aération Naturelle des Habitations dite Aération Différentielle. A. Knapen. (32) June.
- La Fabrication de Gaz Pauvre par Distillation Pyrogénée des Boues de Fosses Septiques. Lucien Cavi. (33) Sept. 21.
- Statistik über den technischen Energiebedarf in neueren Krankenanstalten. Ludwig Dietz. (7) Serial beginning Aug. 10.
- Elektrische Kirchenheizung.* O. Ely. (41) Aug. 15.
- Praktische Versuche, betreffend Lüftung von Geruchverschlüssen an Abwasserleitungen. A. C. Karsten. (7) Aug. 17.
- Müllabfuhr unter Benutzung des Strassenbahnnetzes.* F. Zink. (39) Aug. 20.
- Zur Kenntnis der Schlamm-Messungen innerhalb der Vakuumtonne. K. Thimme. (7) Aug. 24.
- Mechanische Reinigung von Hüttenabwässern.* L. Kropf. (53) Aug. 31.
- Aus der Praxis des Strassenreinigungswesens. J. Bopp. (39) Sept. 5.

Structural.

- Stresses in Tubes.* Reid T. Stewart. (55) Vol. 33.
- The Influence of Carbon on the Corrodibility of Iron.* C. Chappell. (71) Vol. 85.
- Note on the Investigation of Fractures.* F. Rogers. (71) Vol. 85.
- The Corrosion of Nickel, Chromium and Nickel-Chromium Steel.* J. Newton Friend, J. Lloyd Bentley and Walter West. (71) Vol. 85.
- The Mechanism of Corrosion. J. Newton Friend, Walter West and J. Lloyd Bentley. (71) Vol. 85.
- Report of Committee 8 of the Am. Ry. Eng. Assoc. on Masonry.* (85) Vol. 12, Pt. 1; Vol. 13.
- Report of Committee 6 of the Am. Ry. Eng. Assoc. on Buildings.* (85) Vol. 12, Pt. 1, and Vol. 13.
- Report of Special Committee, Am. Ry. Eng. Assoc. on Grading and Inspection of Maintenance of Way Lumber.* (85) Vol. 12, Pt. 3; Vol. 13.
- Standard Specifications for Construction Oak Timbers. (Report of Committee, Am. Ry. Eng. Assoc.) (85) Vol. 12, Pt. 3.
- Report of Committee 17 of the Am. Ry. Eng. Assoc. on Wood Preservation.* (85) Vol. 13.
- Creosote in Treated Piles After Long Service.* (From *Bulletin*, U. S. Forest Service.) (87) Sept.
- Light Compression Members: Topical Discussion. (4) Sept.
- Autoclave Boiling Test for Cement. (Specification Used by the Delaware, Lackawanna & Western.) (67) Sept.
- Testing Sand for Use in Concrete and Cement Mortar. Cloyd M. Chapman, M. Am. Soc. M. E. (67) Sept.
- Investigations of Modified Cements and of Alkali Action on Concrete of the United States Reclamation Service. J. Y. Jewett. (Paper read before the Inter. Assoc. for Testing Materials.) (86) Sept. 4.
- Accelerated Tests for Constancy of Volume in Portland Cements. Max Gary. (Paper read before the Inter. Assoc. for Testing Materials.) (86) Sept. 4.
- Placing Concrete with a Movable Steel Tower.* (96) Sept. 5.
- The Calculation of Stresses in Trusses.* F. E. Turneaure. (13) Sept. 5.
- The Construction and Operation of a Model Municipal Comfort Station.* Burt A. Heinly. (13) Sept. 5.
- A Complicated Waterproofing Problem.* W. S. Lacher. (15) Sept. 6.
- Practical Micrographical Observations for Testing Metals.* The Atelier des Essais de Metaux of the P. L. M. Railway. (Abstract of paper read before the Inter. Assoc. for Testing Materials.) (20) Sept. 6.
- Construction of the New York Municipal Building.* (14) Sept. 7.
- Steel Sets in Inclined Shafts.* Walter Lyman Brown. (103) Sept. 7.
- Pressure of Coal on Storage Bin Walls, the Difference Between Anthracite and Bituminous.* (From *Machinery*.) (19) Sept. 7.
- Excavating Caissons Hydraulically at St. Louis.* (14) Sept. 7.
- Systemizing Formwork for Concrete Construction.* (14) Sept. 7.
- Driving Steel Piles near Insecure Foundations. (14) Sept. 7.

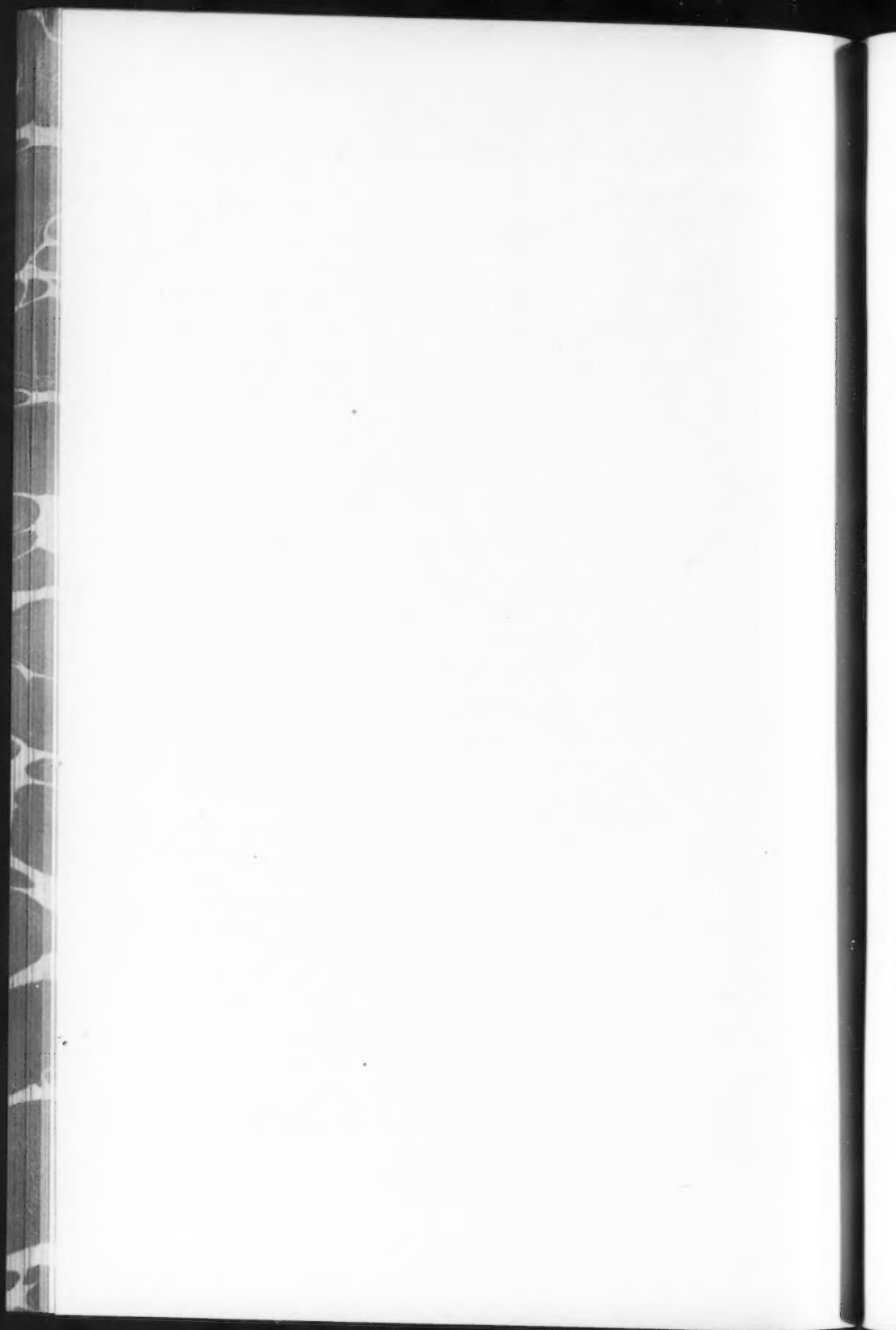
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Structural—(Continued).

- Test Bars for Chillable Cast Irons.* Thomas D. West. (Paper read before the Inter. Assoc. for Testing Materials.) (20) Sept. 12; (62) Sept. 9.
- Defective Concrete Piles.* (13) Sept. 12.
- Investigation of Effect of Fire in a Large Reinforced Concrete Paper Mill.* (96) Sept. 12.
- Rates of Rusting of Iron and Steel. James Aston and Charles F. Burgess. (Paper read before the Inter. Congress for Applied Chemistry.) (105) Sept. 12.
- The Magnetic Properties of Dynamo Sheet Iron.* De Nolly and Veyret. (Paper read before the Inter. Assoc. for Testing Materials.) (20) Sept. 13.
- Five-Acre Flat Slab Concrete Building.* (14) Sept. 14.
- Moving, Turning and Lowering a Large Three-Story Brick Office Building.* (14) Sept. 14.
- Common Brick Stand Severe U. S. Test.* (76) Sept. 15.
- Fire Brick for Use in Lime Kilns. W. L. Hamilton. (Paper read before the National Lime Mfrs. Assoc.) (76) Sept. 15.
- Experiments on the Weathering of Portland Stone. J. S. Owens, Assoc. M. Inst. C. E. (104) Sept. 20.
- New Method for Mechanical Tests on Cast Iron.* C. Fremont. (Abstract of paper read before the Inter. Assoc. for Testing Materials.) (22) Sept. 20.
- The Treatment and Finish of Passenger Car Concrete Floors.* Leo H. Nemzek. (Paper read before the Railway Master Painters Assoc.) (15) Sept. 20.
- Creosoted Wood Blocks for Purposes Other Than Street Pavement. E. A. Sterling. (15) Sept. 20.
- Substructure of the Union Central Life Insurance Building, Cincinnati.* (14) Sept. 21.
- Oil-Mixed Portland Cement Concrete.* Logan Waller Page. (Abstract from *Bulletin 46* of the U. S. Dept. of Agri.) (19) Sept. 21.
- Pneumatic Caisson Foundations of the Adams Express Building, New York.* (14) Sept. 21.
- Wood Preserving Creosotes: Methods of Production, Properties, Quality, Price and Quantity Consumed in the United States. C. P. Winslow. (From *Circular*, U. S. Forest Service.) (86) Sept. 25.
- An Investigation of Relative Economy in Simple Roof Trusses.* Wm. Clyde Willard. (13) Sept. 26.
- Failure of a Retaining Wall at the Kingshighway Viaduct, St. Louis, Mo.* (13) Sept. 26.
- The Design of Girder and Truss Spans and Trestle Work in Structural Steel. F. W. Dencer. (Paper read before the Eng. Soc. of Valparaiso University.) (96) Sept. 26.
- Cranston Carhouse of the Rhode Island Company.* (17) Sept. 28.
- Moments and Arch Action in Continuous Reinforced Concrete Beams and Slabs.* Eli White. (14) Sept. 28.
- The Gale Tests on the Use of Titanium in Malleable Castings. C. H. Gale. (62) Sept. 30.
- Comparison entre les Normes russes et allemandes relatives au Ciment Portland. (84) Aug.
- Sur la Conservation des Ouvrages en Ciment en Contact avec l'Huile et les Corps Gras. Silvio Canevazzi. (84) Aug.
- Les Métaux Poreux.* H. I. Hannover. (93) Sept.
- Relations entre la Macrostructure et la Cristallisation de l'Acier.* N. T. Belaiew. (93) Sept.
- Les Effets de l'Electricité sur le Béton Armé, Recherches Faites à l'Ecole Technique de Darmstadt et à l'Université de Vermont.* (33) Sept. 14.
- L'Injection des Poteaux et des Traverses par le Procédé Rüping, à Zernsdorf (Prusse).* (33) Sept. 21.
- Zeichnerische Ermittlung der Querschnittsabmessungen des doppeltbewehrten Betonbalkens.* Reinhold Neumann. (81) 1912, Pt. 2.
- Beitrag zur Theorie des ebenen Stabzuges mit räumlicher Stützung.* Henri Marcus. (81) 1912, Pt. 5.
- Die Wandelhalle auf der Insel Borkum.* Camillo Friederich. (51) Serial beginning Sup. 16.
- Rationelle Bestimmung der zweckmässigsten Betonzusammensetzung mittels der "Reform-Prüfmaschine."* E. Färber. (51) Sup. No. 17.
- Tresoranlagen in Eisenbeton mit besonderer Panzerung.* S. Zipkes. (51) Serial beginning Sup. No. 18.
- Zwanzig Kesselbleche mit Rissbildung.* R. Baumann. (48) July 13.
- Der moderne Industriebau in technischer und ästhetischer Beziehung. Karl Bernhard. (48) Serial beginning July 20.
- Umschnürte Druckkörper aus Eisenbeton mit Hohlräumen. G. Barkhausen. (48) Aug. 3.
- Zur Ermittlung der Schwingungen in Wasserschloss. Ph. Forchheimer. (48) Aug. 10.
- Ein in Eisenbeton ausgeführter Erz- und Kalksteinsilo.* E. Elwitz. (50) Aug. 15.

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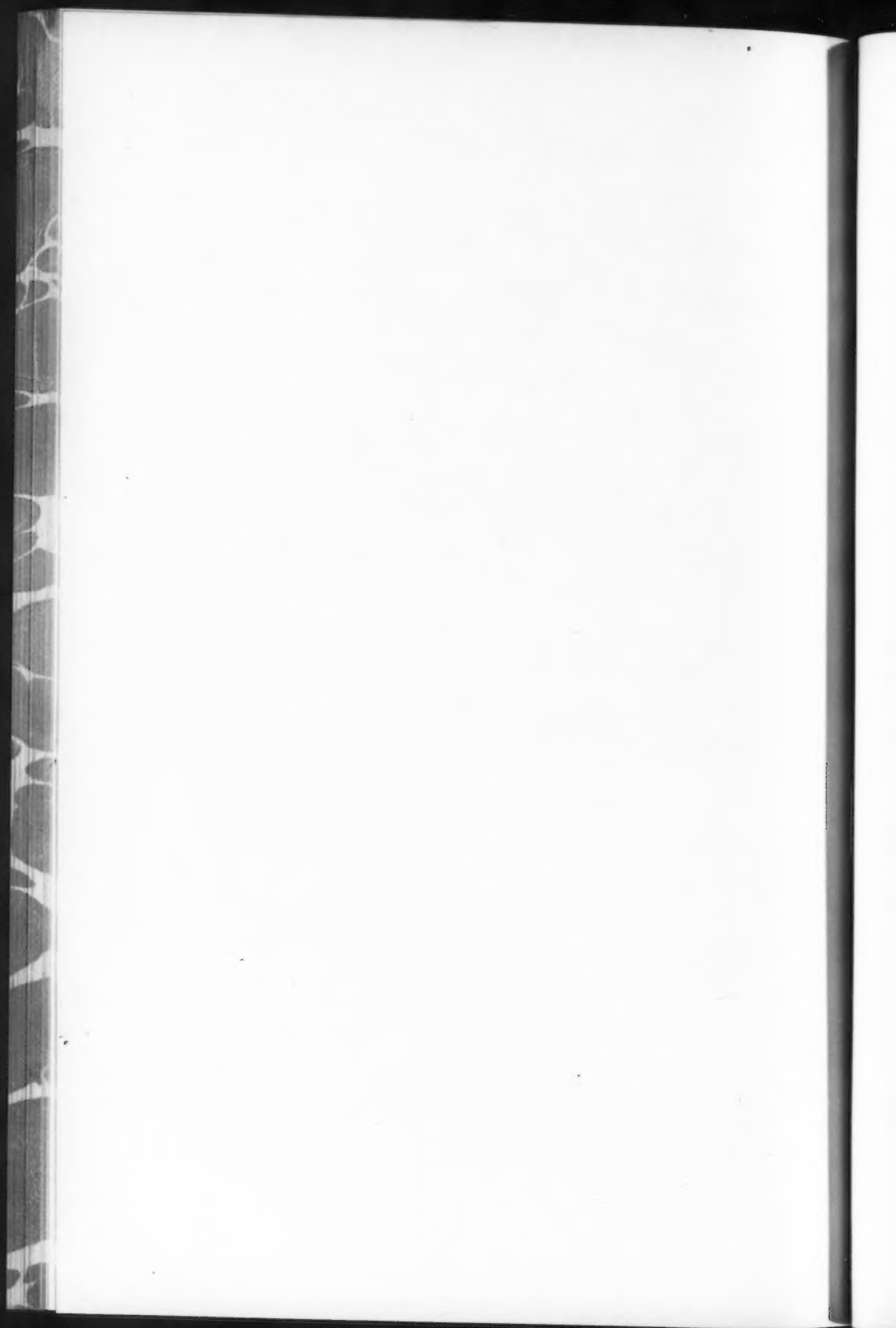
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- Versuche über den Einfluss der Breite bei Kerbschlagprobe.* R. Baumann. (48) Aug. 17.
 Zugversuche mit Stäben, die Eindrehung besitzen.* R. Baumann. (48) Aug. 17.
 Probekelastung von Bauteilen.* Schell. (80) Aug. 22.
 Die Verbundfrage im Eisenbetonbau und die neueren Vorschriften.* A. Kleinogel. (53) Aug. 23.
 Kühlturmbecken.* Kupfer. (80) Aug. 24.
 Fabrikschornstein aus Eisenbeton für Herrn Max Hartmann, Danzig.* (78) Aug. 24.
 Neuanwendungen in Beton. (78) Aug. 24.
 Ein vereinfachtes Verfahren zur raschen Berechnung von Pfostenfachwerken.* H. Marcus. (40) Aug. 24.
 Ueber die Spannungsverteilung in zylindrischen Hängewänden bei unvollkommener Einspannung.* Theodor Pöschl. (53) Aug. 30.
 Schwimmende Fahrzeuge aus Eisenbeton.* Perrey. (80) Aug. 31.
 Kochprobe und Raumbeständigkeit von Portlandzement bei trockener Lagerung. F. Schule. (80) Aug. 31.
 Zeichnerische Bestimmung der Stützenmomente eines Durchlaufenden Balkens auf Elastisch Senkbaren Stützen.* L. Geusen. (69) Sept.
 Günstigste Lage des Gelenkpunktes von Gelenkpfetten bei Berücksichtigung der Durchbiegung der Pfette.* Thomas Schwarz. (69) Sept.
 Die Eisenbauten des umgebauten Bühnenhauses vom Königlichen Opernhaus in Berlin.* A. Fischer. (40) Sept. 7.
 Zur Kenntnis des Rüdersdorfer Schlammtonen. (80) Sept. 12.
 Kohlensilo von 100 000 m³ Fassungsraum für die Stadt Hamburg, Gaswerk Grasbrook.* Josef Gaugusch. (78) Sept. 13.
 Untersuchung eines Stockwerkrahmens.* Hans Leitner. (78) Sept. 13.
 Ueber die voraussichtliche Lebensdauer imprägnierter Holzmasten. Robert Nowotny. (41) Sept. 19.
 Billige feuersichere Decken. H. Grunwald. (80) Sept. 19.
 Inhaltsberechnung von Gewölben.* Otto Henkel. (80) Sept. 21.

Water Supply.

- Water Tank Specifications.* (Report of Committee, Am. Ry. Eng. Assoc.) (85) Vol. 12, Pt. 3.
 Large Capacity Pumping Plant for Region with Limited Flow in Water Stratum.* C. A. Morse. (85) Vol. 12, Pt. 3.
 Report of Committee 13, Am. Ry. Eng. Assoc. on Water Service. (85) Vol. 12, Pt. 3, and Vol. 13.
 Efficiency in Water Filtration.* (10) Aug.
 Concrete Water Tanks (Chicago City Railways).* (67) Sept.
 Reinforced Concrete Tank at Sir Johns Run, W. Va.* A. M. Wolf. (87) Sept.
 Purification of Bath Water.* Frank C. Perkins. (60) Sept.
 The Conveyance of Irrigation Water; Practice in British Columbia. B. A. Etcheverry. (From Report to Dept. of Agri., Province of British Columbia.) (86) Sept. 4.
 A Convenient and Economical Method of Subdividing Tracts of Irrigated Lands.* W. C. McNown. (13) Sept. 5.
 Four Alternate Designs of Hollow Concrete Dams for Stony River Dam, Grant Co., W. Va.* Edward Wegmann. (13) Sept. 5.
 Evaporation from Irrigated Soils.* Samuel Fortier. (13) Sept. 5.
 Leicester Water Supply from the Derwent Valley.* (12) Sept. 6.
 Sterilization of Water by Ultra-Violet Rays. (104) Sept. 6.
 Electric Deep-Well Pumping.* J. E. Bullard. (27) Sept. 7.
 Western Canada Power Company's System.* (27) Sept. 7.
 The Conservation of Snow: Its Dependence on Forests and Mountains.* J. E. Church, Jr. (19) Sept. 7.
 Operation of the Bangor Filters. (14) Sept. 7.
 Turbo Pumps in German Water Works.* Alfred Gradenwitz. (64) Sept. 10.
 Flood Prevention by Storage Reservoirs in Foreign Countries: General Costs. (86) Sept. 11.
 Enlargement and Improvement of the Main Canal, Sunnyside Unit, Yakima Project, Washington.* E. A. Moritz and H. W. Elder. (86) Sept. 11.
 The Awakening of Canadian Irrigationists.* Norman S. Rankin. (Report of the Western Canada Irrig. Assoc.) (96) Sept. 12.
 The New Pumping Installation of the City of Evansville, Ind.* (13) Sept. 12.
 Wells as Sources of Supplementary Water-Supplies. Myron L. Fuller. (13) Sept. 12.
 The Commercial Economy of Turbine Pumps.* F. Zur Nedden and H. B. Maxwell. (Paper read before the South African Inst. of Engrs.) (47) Sept. 13;
 (22) Serial beginning Aug. 30.
 System of the Pacific Power & Light Co.* (27) Sept. 14.
 A 6 000-Acre Irrigation Project on the Arroyo Hondo, New Mexico.* (14) Sept. 14.

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Water Supply—(Continued).

- Hypochlorite Sterilization of Water Supplies. C. A. Jennings. (Abstract of paper read before the Inter. Cong. of Applied Chemistry.) (14) Sept. 14.
- The New Water-Works System of Cumberland, Maryland.* (14) Sept. 14.
- Hydroelectric Development on Big Creek, California.* (14) Sept. 14; (27) Sept. 7.
- Proposed Hetch Hetchy Water Supply, San Francisco. (14) Sept. 14.
- A New Principle in Centrifugal Pump and Condenser.* (62) Sept. 16.
- Algae and Their Relation to Public Water Supplies. L. H. Van Buskirk. (From *Monthly Bulletin*, Ohio State Board of Health.) (96) Sept. 19.
- The Adamello Hydro-Electric Plant, Lago D'Arno.* (12) Serial beginning Sept. 20.
- Ashton-under-Lyne, Stalybridge, and Dukinfield Waterworks.* (12) Sept. 20.
- New Snake River Water-Power Plant of Idaho Falls, Idaho.* (27) Sept. 21.
- Water-Measuring Device.* R. G. Hosea. (14) Sept. 21.
- Enlargement of the Coquitlam-Buntzen Hydroelectric Power Development.* Chas. A. Lee. (14) Sept. 21.
- Concrete Construction Costs in Cuba.* Henry A. Young. (14) Sept. 21.
- Hydraulic Excavation at Panama.* Fred H. Calvin. (64) Sept. 24.
- The Causes of Breaks in Large Water Mains and Available Preventive Measures; with Special Reference to the Detroit Water Works System. Gardner S. Williams. (86) Sept. 25.
- Units of Measurement of Irrigation Water and Methods of Measuring Water.* B. A. Etcheverry. (86) Sept. 25.
- How to Obtain Efficiency from Pressure Filters. H. W. Cowan. (Paper read before the Canadian Public Health Assoc. Congress.) (96) Sept. 26.
- The Purification of Water from Standpoints Other than the Hygienic Aspect.* George W. Fuller. (Paper read before the Inter. Cong. on Hygiene and Demography.) (96) Sept. 26.
- A Hydroelectric Power Plant in Chile.* E. H. Hatch. (14) Sept. 28.
- Failure of Navigable Pass Foundation, Ohio River Dam.* (19) Sept. 28.
- Centrifugal Pumps for Condensers.* Richard L. Strobridge. (64) Oct. 1.
- Flow of Water Through Check Valves.* James A. Donnelly. (Paper read before the Modern Science Club of Brooklyn.) (64) Oct. 1.
- L'Anti-Bélier Pneumatique *I'ideal*.* Léon Masson. (92) July.
- Epuration des Eaux par la Permutite du Professeur Gans.* L. Clerc. (34) Sept.
- Constructions Diverses en Béton de Ciment Armé, Système Monnoyer.* (35) Sept.
- Das neue Wasserwerk der Stadt Hannover in Elze.* A. Bock. (81) 1912, Pt. 2.
- Das Wasserkraftwerk *El Molinar* am Jucar.* K. Meyer. (48) Serial beginning July 27.
- Ueber die Wahl der Wasserturbinengattung in zweifelhaften Fällen. F. Leubner. (48) Aug. 3.
- Eisenbetonkanal des Hauptwassersammlers zu Lichtenberg.* E. Schlotterer und Max Rüdiger. (78) Aug. 24.
- Ueber die Kohlensäuren Kalk angreifende Kohlensäure der natürlichen Wässer. J. Tillmans und O. Heublin. (7) Aug. 24.
- Absperrorgane durch den Auftrieb von Flüssigkeiten betätigt.* Josef Fichtl. (7) Sept. 7.

Waterways.

- River Protection Work.* C. H. Miller. (85) Vol. 12, Pt. 3.
- Coast Erosion and Protection.* Ernest R. Matthews, A. M. Inst. C. E. (11) Serial beginning Aug. 30.
- The Levee System as a Means of Control of Flood Waters. Arsene Perrilliat. (Paper read before the Louisiana Eng. Soc.) (1) Sept.
- Forestation and Its Relation to Flood Waters of the Lower Mississippi River. W. B. Gregory. (Paper read before the Louisiana Eng. Soc.) (1) Sept.
- Flood Protection of New Orleans, Topography and Geology of the Mississippi River Valley. Sidney F. Lewis. (Paper read before the Louisiana Eng. Soc.) (1) Sept.
- Increased Wealth to be Derived from Efficient Control of Flood Waters of the Mississippi River. George H. Davis. (Paper read before the Louisiana Eng. Soc.) (1) Sept.
- Reservoir Systems and Their Relations to Flood Protection. C. O. Sherrill. (Paper read before the Louisiana Eng. Soc.) (1) Sept.
- Possible Ultimate Height of Flood Waters Under the Levee System of Protection; With Suggestions as to Typical Sections of Levees. Walstan E. Knobloch. (Paper read before the Louisiana Eng. Soc.) (1) Sept.
- Operations of Dipper and Bucket Dredges Owned by the United States Government. (13) Sept. 5.
- Dredges Operated by Oil Engines.* (13) Sept. 12.
- Gaging Minnesota Streams in Winter.* W. G. Hoyt. (13) Sept. 12.
- Reinforced Concrete Barges for Sludge Pumps, Manchester Ship Canal.* (86) Sept. 18.

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Waterways—(Continued).

- Methods and Cost of Damming the Hymelia Crevasse in the Mississippi River.* (86) Sept. 18.
- Break in the New York State Barge Canal at the Irondequoit Creek Crossing.* (13) Sept. 19; (14) Sept. 28.
- River Improvement by Regulation and Dredging. Wm. W. Harts. (Abstract of paper read before the Inter. Congress on Navigation.) (96) Sept. 19.
- The Port and Harbor of Havre (France).* (13) Sept. 19.
- Cost of Dredging 32 000 000 cu. yds. of Material with Sea-Going Government Dredges in 1911. (86) Sept. 25.
- A Flood in the Caloosahatchee River Valley.* W. W. Fineren. (13) Sept. 26.
- Launching a Steel Dredge Hull.* Lewis H. Eddy. (16) Sept. 28.
- Fire Protection of Pier Sheds.* Sydney G. Koon. (95) Oct.
- Noté sur les Types de Murs de Quai Adoptés à Bordeaux dans les Vingt-Cinq Dernières Années.* P. Barrillon. (43) July.
- Les Travaux d'Extension du Bief Intermédiaire à Gand.* L. Bonnet. (30) Aug.
- Appareil à Soulèvement Vertical pour Travaux à la Mer.* N. de Tédesco. (84) Aug.
- Travaux en Ciment Armé au Cap.* (From *Concrete and Constructional Engineering*.) (84) Aug.
- Note sur les Presses Hydrauliques Frettées des Ascenseurs No. 2, 3 et 4 du Canal du Centre.* J. Kraft de la Saulx. (30) Aug.
- Les Dragues.* A. Baril. (37) Aug. 31.
- Zum Bau des Rhein-Herne Kanals.* (40) Apr. 27.

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